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Statistiques  
des transports  
en Amérique  
du Nord

North American  
Transportation  
in Figures

El Transporte  
de América  
del Norte  
en Cifras

CAI  
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-2000  
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*English Edition*





# North American Transportation in Figures

BTS00-05





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## **North American Transportation Statistics Project**

A tricountry working group was responsible for this project. Agencies represented included Statistics Canada and Transport Canada from Canada; the Secretaría de Comunicaciones y Transportes, the Instituto Mexicano del Transporte and the Instituto Nacional de Estadística, Geografía e Informática (INEGI) from Mexico; and the Bureau of Transportation Statistics and the Census Bureau from the United States. The final product, however, would not have been possible without the many substantial contributions from people in each country who were not members of the working group, and who are represented by the supporting agencies and organizations listed below.

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Department of Transportation, Federal Aviation Administration

Department of Transportation, Federal Highway Administration

Department of Transportation, Federal Railroad Administration

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# p r e f a c e

*North American Transportation in Figures* examines transportation and transportation-related passenger, freight, economic, safety, energy, environmental and demographic statistics relating to Canada, Mexico and the United States. This publication serves to increase awareness of transportation-related statistics currently available in each of the three countries, helps to assess comparability of the data, determines where information gaps exist and reveals which additional data are needed for a more complete picture of transportation in North America.

This project is a direct result of the North American Transportation Statistics Interchange, a tripartite initiative representing the transportation and statistical agencies of Canada, Mexico and the United States. Updates to this publication will continue on a periodic basis.





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# I n t r o d u c t i o n

The rate of global economic growth and the integration of trade, finance and manufacturing have increased greatly over the last two decades. Transportation plays a vital role in the changing global economy, linking people and places, facilitating trade and tourism and encouraging economic competition and specialization. The North American<sup>1</sup> experience mirrors these worldwide trends. Reduced trade barriers and increasingly mobile populations have created a heightened need for information on transportation infrastructure and services within and across Canada, Mexico and the United States. Two major initiatives, the Canada-U.S. Free Trade Agreement (FTA)<sup>2</sup> and the subsequent North American Free Trade Agreement (NAFTA),<sup>3</sup> were significant milestones in the liberalization of trade in goods and services between the three countries of this continent.

An effective, efficient and safe transportation system is critical to any nation's economic growth, the mobility of its citizens and its national security. Each day, governments, businesses and consumers make countless decisions about where to locate facilities and make investments, what to ship, which transportation mode to use and how and where to travel on business or for pleasure. Transportation provides the links between businesses, industries and consumers, and the merits of transportation go beyond the national borders of any one country. While the positive contributions of transportation to the national economies and to the daily life of people everywhere are quite important,

transportation also has some adverse impacts. Transportation uses significant amounts of energy, mostly derived from petroleum, and is also a major cause of death and injury every year. This report strives to present a balanced picture of the benefits transportation confers as well as the impacts it has.

The effectiveness and efficiency of national and North American transportation relies heavily on sound information. Within and across countries, comprehensive transportation information makes knowledgeable decisions possible, on personal, corporate and national policy levels. Accurate data, comparable across modes and countries, is important in order to make effective investments with scarce resources; to understand changes in dynamic transportation markets; to evaluate transportation benefits and impacts; and to support critical decision-making in the public and private sectors. In short, accurate, comprehensive and timely transportation-related information is a key component in business, government and personal decisionmaking.

A trilateral initiative, the North American Transportation Statistics Interchange (Interchange), first identified a need for a compendium of transportation and transportation-related data for Canada, Mexico and the United States. The Interchange is an initiative between the transportation and statistical agencies of Canada, Mexico and the United States, and provides a forum for the exchange of information and for the discussion of topics and issues related to transportation statistics in and among the participating countries. The first Interchange meeting

<sup>1</sup> For the purposes of this report, North America will refer to the countries of Canada, Mexico and the United States.

<sup>2</sup> The FTA entered into force on January 1, 1989.

<sup>3</sup> NAFTA entered into force on January 1, 1994.

was held in November 1991, and regular meetings have been held since then.

In addition to promoting closer working ties between the transportation and statistical agencies of the three countries, the Interchange has led to a number of key projects, including: the joint Canadian and U.S. development of the Standard Classification of Transported Goods (SCTG), the resolution of data inconsistencies in transborder merchandise trade data and the exchange of ideas on the development of national reports. Trilateral cooperation between the three countries also led to the development of the North American Industrial Classification System (NAICS), provided for an exchange of ideas on how to improve and standardize the handling of transportation data in national economic accounts, and resulted in an agreement to jointly develop a project on North American transportation statistics. Since 1997, a tricountry working group has been coordinating the work of this later project. Participating agencies include Statistics Canada and Transport Canada from Canada; the Secretaría de Comunicaciones y Transportes (Ministry of Communications and Transportation), the Instituto Mexicano del Transporte (Mexican Institute of Transportation) and the Instituto Nacional de Estadística, Geografía e Informática (INEGI) (National Institute of Statistics, Geography and Informatics) from Mexico; and the Bureau of Transportation Statistics and the U.S. Census Bureau from the United States.

The North American Transportation Statistics project has had a number of key objectives. These are: (a) to identify key information that will help provide a comprehensive view of transportation in North America, (b) to characterize transportation activity and impacts across and between Canada, Mexico and

the United States, (c) to reveal specific data comparability differences within and across countries, (d) to identify data and information gaps and (e) to begin discussions for reducing comparability differences and data gaps through cooperative activities. This report, *North American Transportation in Figures*, is one of the outcomes of this project, and represents the second joint effort by the three countries to develop a statistical report related to transportation.<sup>4</sup> It is expected that the information will be updated on a periodic basis, giving users a recognized source for transportation and other related data in a North American context.

*North American Transportation in Figures* provides a comprehensive overview of transportation statistics in North America. English, French and Spanish editions of the report are available. The report includes data for 1990, 1995 and 1996, the latest years for which comparable data are readily available. All of the value data are reported in current U.S. dollars. All measurement units are in metric.<sup>5</sup> Users should note that, for the sake of greater comparability across the three countries, data categories and definitions were extensively reviewed and modified when necessary. Therefore, some of the data categories and definitions used in this report may not always correspond to those used in the specific national publications of Canada, Mexico and the United States. Users, who require data in original categories, currencies or measures, a complete time series or other

<sup>4</sup> In December 1999, a brief summary report, *North American Transportation Highlights*, was published based on the work and data included in this report, *North American Transportation in Figures*.

<sup>5</sup> Conversion ratios to U.S. measures are included in Appendix C. Appendix D reports data in U.S. measures for specific tables.



additional information, may contact the appropriate source agency in each country.

Each language edition of the report contains over 90 data tables, supported by graphs, figures, maps and a number of appendixes. Appendix A includes an overview of the transportation statistical system in each of the three countries, including information on specific agencies and their roles and responsibilities for transportation data. In most cases, Appendix A also provides web site addresses where additional detailed information is available for specific data sets and series. Appendix B provides additional technical notes for each of the data tables, and explains the differences in data sources, survey methodologies, collection approaches and definitions among the three countries. Information provided here supplements footnotes included on individual tables. Appendix C contains additional reference charts, including: the International Monetary Fund (IMF) exchange rates used, state and provincial abbreviations, U.S.-metric conversion ratios, land border crossing ports and the Harmonized Schedule for international merchandise trade at the two-digit level. Appendix D provides selected tables in U.S. measures.

*North American Transportation in Figures* contains twelve thematic sections. Section 1, Country Overview, sets the context of the report with an overview of each country: population, labor force, physical area and Gross Domestic Product (GDP). Section 2, Transportation and the Economy, draws a comprehensive picture of the impact that transportation has on the economic indicators of each country (including GDP), government expenditures for transportation, and transportation

employment. Section 3, Transportation Safety, provides critical information on fatalities and injuries by mode. Fatality and injury rates for road and air also are included. Section 4, Transportation, Energy and the Environment, responds to current energy and environmental concerns, and includes tables on energy consumption, fuel costs and emission control requirements. Section 5, Domestic Freight Activity, summarizes freight activity by mode, by major commodity and by major origin/destination pair. Sections 6 and 7 provide data on North American merchandise trade and international merchandise trade between North America and the rest of the world. For Section 6, each country decided to use its own merchandise trade data. Thus, there will be statistical differences when comparing, for example, Canada's data for trade with the United States and the United State's data for trade with Canada. Section 7 represents international merchandise trade for each country, excluding trade with the other North American countries. Sections 8, 9 and 10 provide data on domestic, North American and international passenger travel. Section 9 presents a picture of North American travel with information about the type of travel (overnight versus same-day), mode of transportation used and trip purpose. Section 10 provides data on international passenger travel between North America and the rest of the world. Section 11, concentrates on transportation infrastructure and its use in each country. Section 12, Transportation Vehicles, provides a detailed inventory of transportation vehicles and equipment and summarizes domestic movements, in terms of vehicle-kilometers, by mode.

A number of standard symbols were adopted for use on the statistical tables. These are as follows:

- C = Data are confidential
- N = Data are nonexistent
- NA = Not applicable
- NS = Not significant
- U = Data are unavailable
- e = Data are estimated
- p = Data are preliminary
- r = Data are revised

In addition, the unit “billions” in this edition equates to “thousand millions” in the Spanish edition, and one milliard in the French edition.

An electronic version of *North American Transportation in Figures*, including downloadable spreadsheet files, also will be available on the web sites of the agencies involved in the North American Transportation Statistics project. The specific agency addresses are as follows:

### **Canada**

Statistics Canada  
[www.statcan.ca](http://www.statcan.ca)

Transport Canada  
[www.tc.gc.ca](http://www.tc.gc.ca)

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Instituto Mexicano del Transporte (Mexican Institute of Transportation)  
[www.imt.mx](http://www.imt.mx)

Instituto Nacional de Estadística, Geografía e Informática (INEGI, National Institute of Statistics, Geography and Informatics)  
[www.inegi.gob.mx](http://www.inegi.gob.mx)

Secretaría de Comunicaciones y Transportes (Ministry of Communications and Transport)  
[www.sct.gob.mx](http://www.sct.gob.mx)

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Bureau of Transportation Statistics,  
U.S. Department of Transportation  
[www.bts.gov](http://www.bts.gov)

U.S. Census Bureau,  
U.S. Department of Commerce  
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# section 1

## Country Overview





table 1-1

# National Population and Labor Force

(Millions)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1997	1990	1995	1996
<b>National population, total</b>	<b>27.8</b>	<b>29.6</b>	<b>30.0</b>	<b>81.2</b>	<b>91.2</b>	<b>93.7</b>	<b>248.7</b>	<b>262.9</b>	<b>265.3</b>
Females	14.0	14.9	15.1	41.3	46.3	48.0	127.5	134.3	135.5
Males	13.8	14.7	14.9	39.9	44.9	45.7	121.2	128.5	129.8
<b>Age structure</b>									
Ages 14 and under	5.8	6.0	6.0	31.1	32.3	32.7	53.5	57.2	57.7
Percent of total population	20.9	20.3	20.0	38.3	35.4	34.9	21.5	21.8	21.8
Ages 15-34	9.2	8.9	8.9	29.3	33.7	33.6	80.0	77.6	76.6
Percent of total population	33.1	30.1	29.7	36.1	37.0	35.9	32.2	29.5	28.9
Ages 35-64	9.7	11.1	11.5	16.9	20.9	22.8	83.9	94.7	97.1
Percent of total population	34.9	37.5	38.3	20.8	22.9	24.3	33.7	36.0	36.6
Ages 65+	3.1	3.6	3.6	3.9	4.3	4.6	31.2	33.4	33.8
Percent of total population	11.1	12.1	12.0	4.8	4.7	4.9	12.6	12.7	12.7
<b>Urban population</b>									
Percent of urban population	N	N	77.9	71.3	73.5	74.0	79.7	<sup>e</sup> 79.8	<sup>e</sup> 79.8
<b>Population density</b>									
Number of people (per square kilometer)	3	3	3	41	46	48	27	29	29
<b>Labor force, total</b>	<b>14.3</b>	<b>14.9</b>	<b>15.1</b>	<b>31.2</b>	<b>35.6</b>	<b>36.6</b>	<b>125.8</b>	<b>132.3</b>	<b>133.9</b>
Percent of total population	51.4	50.3	50.3	37.5	39.0	39.6	50.6	50.3	50.5

KEY: e = Data are estimated. N = Data are nonexistent.

## SOURCES

### Canada

National population and labor force: Statistics Canada. *Annual Demographics Statistics, Catalogue No. 91-213-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Urban population: Statistics Canada. 1996 Census of Population. *A national overview- population and dwelling counts, Catalogue No. 93-357-XPB*. (Ottawa, Ont.: 1997).

### Mexico

National and urban population: Instituto Nacional de Estadística, Geografía e Informática. *XI Censo General de Población y Vivienda, 1990. Estados Unidos Mexicanos. Perfil Sociodemográfico*. (Aguascalientes, Agu.: 1992).

Instituto Nacional de Estadística, Geografía e Informática. *Conteo de Población y Vivienda, 1995. Estados Unidos Mexicanos. Resultados Definitivos. Tabulados Básicos*. (Aguascalientes, Agu.: 1996).

Instituto Nacional de Estadística, Geografía e Informática. *Conteo de Población y Vivienda, 1995. Estados Unidos Mexicanos. Perfil Sociodemográfico*. (Aguascalientes, Agu.: 1997).

Instituto Nacional de Estadística, Geografía e Informática. *Encuesta Nacional de la Dinámica Demográfica, 1997*. (Aguascalientes, Agu.: 1997).

Labor force: Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. *Encuesta Nacional de Empleo, 1991, 1995 and 1996*. (Aguascalientes, Agu.: various years).

### United States

National population and age structure: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States: 1998*. (Washington, DC: 1998).

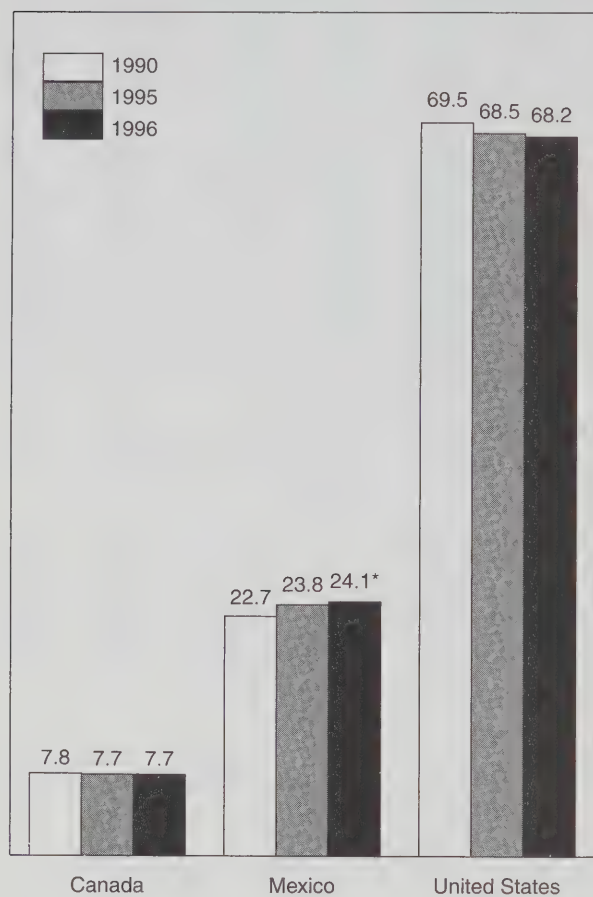
Urban population: U.S. Department of Commerce. U.S. Census Bureau. *Estimates of the Population of Metropolitan Areas: Annual Time Series, July 1, 1991, to July 1, 1996*. (Washington, DC: 1997).

Population density: U.S. Department of Commerce. U.S. Census Bureau. *State Population Estimates: Annual Time Series, July 1, 1990, to July 1, 1998*. (Washington, DC: 1998).

Labor force: U.S. Department of Commerce. U.S. Census Bureau and the Bureau of Labor Statistics. *Current Population Survey*. (Washington, DC: 1998).

**figure** 1-1a

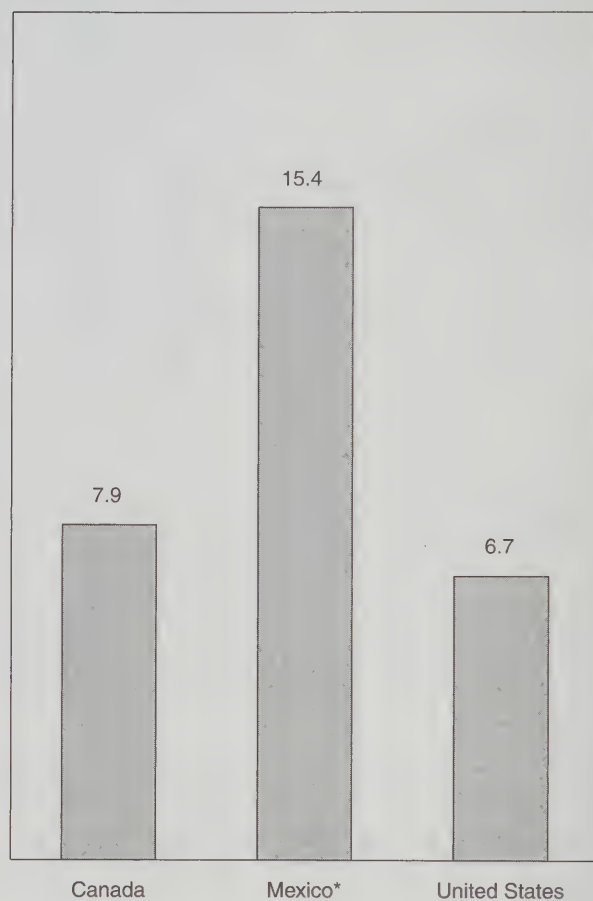
# Percent Share of North American Population: 1990, 1995 and 1996



\*Mexico's last data year is 1997.  
Notes and sources: See Table 1-1.

**figure** 1-1b

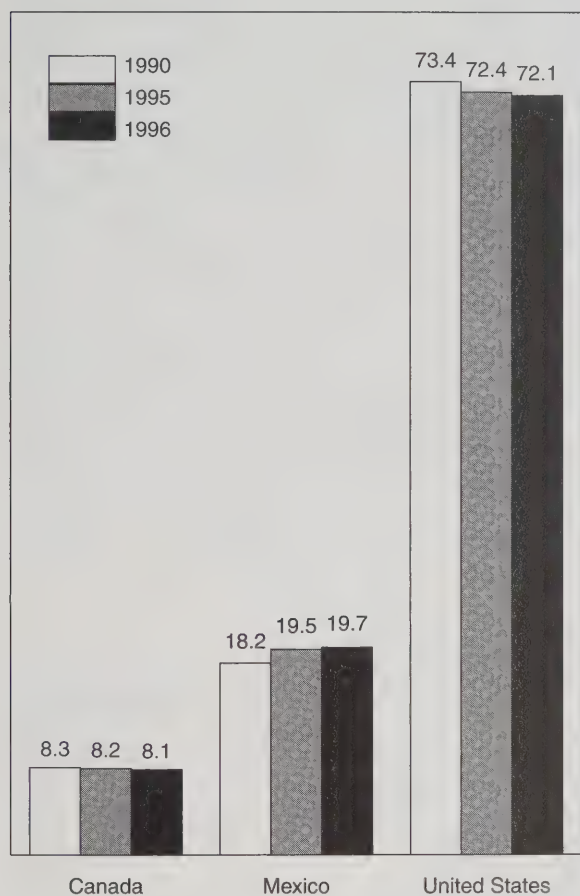
# Percent Change in Population: 1990 to 1996



\*Mexico's last data year is 1997.  
Notes and sources: See Table 1-1.

**figure 1-1c**

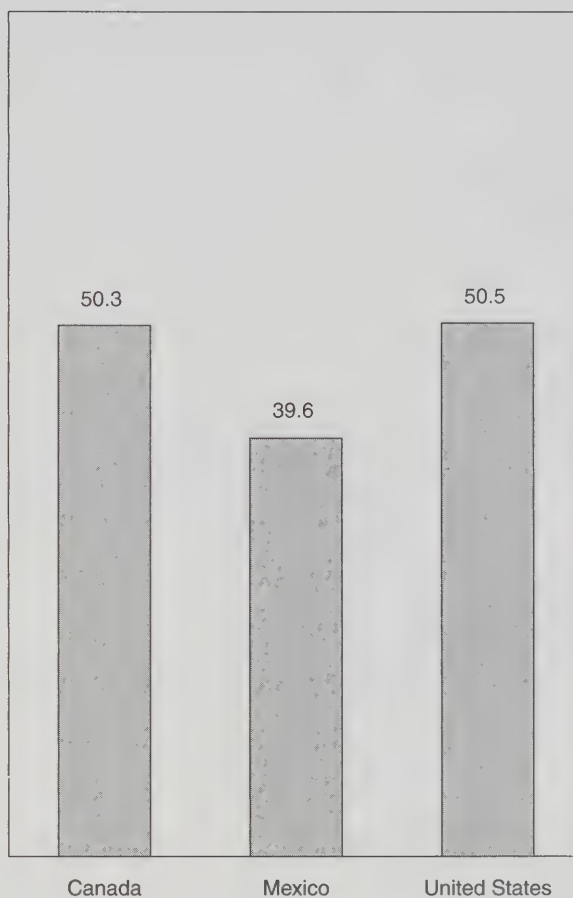
Percent Share of North American Labor Force:  
1990, 1995 and 1996



Notes and sources: See Table 1-1.

**figure 1-1d**

Labor Force as a Percent  
of Total National  
Population: 1996



Notes and sources: See Table 1-1.



**table 1-1a**

## Top 25 Canadian Population Centers: 1996

(Thousands)

Metropolitan area	1996	Metropolitan area	1996
Toronto, Ont.	4,445	Windsor, Ont.	292
Montréal, Que.	3,359	Oshawa, Ont.	281
Vancouver, B.C.	1,891	Saskatoon, Sask.	222
Ottawa, Ont.-Hull, Que.	1,031	Regina, Sask.	199
Edmonton, Alta.	892	St. John's, Nfld.	178
Calgary, Alta.	852	Chicoutimi-Jonquière, Que.	167
Québec, Que.	698	Sudbury, Ont.	166
Winnipeg, Man.	677	Sherbrooke, Que.	150
Hamilton, Ont.	650	Trois-Rivières, Que.	144
London, Ont.	416	Saint John, N.B.	129
Kitchener, Ont.	403	Thunder Bay, Ont.	131
St. Catharines, Ont.	390	<b>Total of top 25</b>	<b>18,421</b>
Halifax, H.S.	347		
Victoria, B.C.	313	<b>Percent of total Canadian population</b>	<b>61.5</b>

**SOURCE:** Statistics Canada. *Annual Demographics Statistics, Catalogue No. 91-213-XPB*. (Ottawa, Ont.: 1998).

**table 1-1b**

## Top 25 Mexican Population Centers: 1995

(Thousands)

Metropolitan area	1995	Metropolitan area	1995
Mexico City, D.F. (MZ)	16,674	Acapulco de Juárez, Gro. (City)	687
Guadalajara, Jal. (MZ)	3,462	Querétaro, Qro. (MZ)	680
Monterrey, N.L. (MZ)	3,022	Cuernavaca, Mor. (MZ)	672
Puebla, Pue. (MZ)	1,562	Aguascalientes, Ags. (MZ)	637
León, Gto. (MZ)	1,174	Chihuahua, Chih. (MZ)	628
Toluca, Edo. de Méx. (MZ)	1,080	Coatzacoalcos, Ver. (MZ)	594
Ciudad Juárez, Chih. (MZ)	1,012	Saltillo, Coah. (MZ)	583
Tijuana, B.C. (City)	992	Morelia, Mich. (MZ)	578
Torreón, Coah.-Gómez Palacio, Dgo. (MZ)	871	Orizaba, Ver. (MZ)	567
San Luis Potosí, S.L.P. (MZ)	782	Veracruz, Ver. (MZ)	560
Mérida, Yuc. (MZ)	780	Hermosillo, Son. (City)	559
Tampico, Tamps. (MZ)	719	<b>Total of top 25</b>	<b>40,267</b>
Culiacán, Sin. (City)	696		
Mexicali, B.C. (City)	696	<b>Percent of total Mexican population</b>	<b>44.1</b>

**NOTE:** For definitions and explanations of city and MZ (metropolitan zone), see Appendix B.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Estadísticas del Medio Ambiente, 1997*. (Aguascalientes, Ags.: 1998).

table 1-1c

## Top 25 U.S. Population Centers: 1996

(Thousands)

Metropolitan area	1996	Metropolitan area	1996
New York, NY-NJ-CT-PA (CMSA)	19,938	Minneapolis-St. Paul, MN-WI (MSA)	2,765
Los Angeles, CA (CMSA)	15,495	Phoenix-Mesa, AZ (MSA)	2,747
Chicago, IL-IN-WI (CMSA)	8,600	San Diego, CA (MSA)	2,655
Washington-Baltimore, DC-MD-VA-WV (CMSA)	7,165	St. Louis, MO-IL (MSA)	2,548
San Francisco-Oakland, CA (CMSA)	6,605	Pittsburgh, PA (MSA)	2,747
Philadelphia, PA-NJ-DE-MD (CMSA)	5,973	Denver, CO (CMSA)	2,277
Boston, MA-NH-ME-CT (CMSA)	5,563	Tampa, FL (MSA)	2,199
Detroit, MI (CMSA)	5,284	Portland, OR-WA (CMSA)	2,078
Dallas-Ft. Worth, TX (CMSA)	4,575	Cincinnati, OH-KY-IN (CMSA)	1,921
Houston, TX (CMSA)	4,253	Kansas City, MO-KS (MSA)	1,690
Atlanta, GA (MSA)	3,541	Milwaukee, WI (CMSA)	1,643
Miami-Ft. Lauderdale, FL (CMSA)	3,514	<b>Total of top 25</b>	<b>122,010</b>
Seattle-Tacoma, WA (CMSA)	3,321		
Cleveland-Akron, OH (CMSA)	2,913	<b>Percent of total U.S. population</b>	<b>45.9</b>

**NOTE:** For definitions and explanations of MSA (metropolitan statistical area) and CMSA (consolidated metropolitan statistical area), see Appendix B.

**SOURCE:** U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States: 1998*. (Washington, DC: 1998).

table 1-2

## Area

(Number of square kilometers)

	Canada	Mexico	United States
<b>Total area</b>	<b>9,970,610</b>	<b>2,173,375</b>	<b>9,629,091</b>
Land area	9,215,430	1,959,248	9,158,960
Water area	755,180	214,127	470,131

### SOURCES

#### Canada

Natural Resources Canada. GeoAccess Division. (Ottawa, Ont.: 1998).

#### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Geografía. (Aguascalientes, Ags.: 1998).

#### United States

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States: 1998*. (Washington, DC: 1998).

# Top 25 Population Centers per Country: 1996

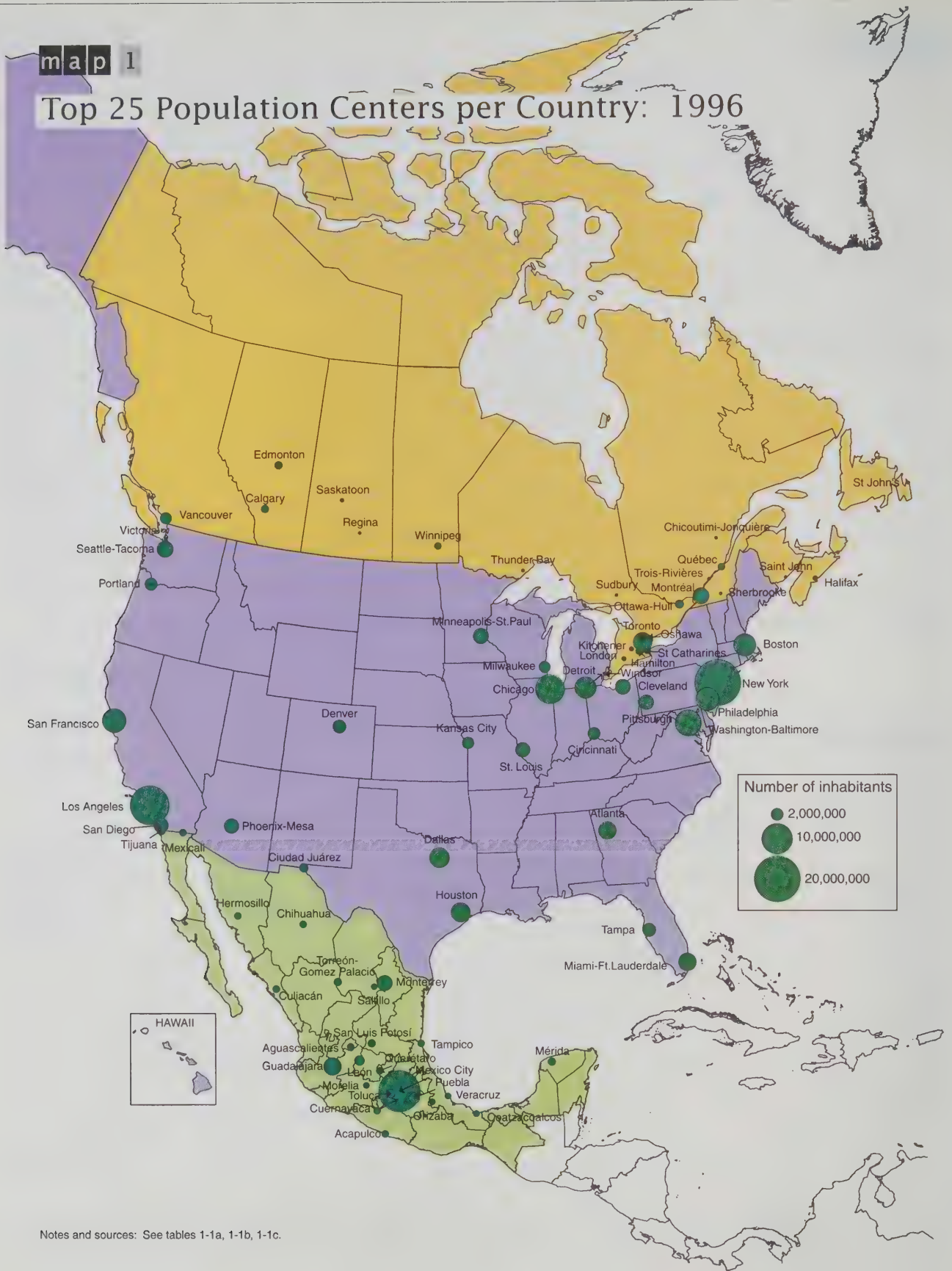




table 1-3

# Gross Domestic Product by Industry

(Current value, billions (or thousand millions) of U.S. dollars)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total</b>	<b>540.1</b>	<b>545.9</b>	<b>P568.7</b>	<b>240.4</b>	<b>261.5</b>	<b>302.2</b>	<b>5,743.8</b>	<b>7,269.6</b>	<b>7,661.6</b>
Agriculture, forestry and fishing	12.4	14.1	15.2	18.9	14.3	18.4	108.7	109.5	130.4
Mining	23.8	21.3	25.5	5.6	4.5	4.7	112.3	98.7	113.8
Construction	41.7	28.9	30.2	9.4	10.6	12.6	245.2	286.4	311.9
Manufacturing	91.6	100.8	104.2	50.0	54.5	65.1	1,031.4	1,282.2	1,309.1
<b>Transportation</b>	<b>18.3</b>	<b>18.9</b>	<b>19.3</b>	<b>19.0</b>	<b>21.8</b>	<b>26.1</b>	<b>176.4</b>	<b>226.1</b>	<b>237.0</b>
Trucking, warehousing and storage	7.7	8.7	8.6	9.7	9.4	11.3	75.8	98.0	92.9
Railroad	2.6	2.3	2.5	0.8	0.5	0.5	19.6	22.9	23.4
Water	1.6	1.4	1.3	0.7	0.7	0.7	9.7	10.9	11.7
Pipeline, excluding natural gas	0.6	0.6	0.6	U	U	U	5.0	4.9	5.2
Air	3.2	3.2	3.4	0.4	0.7	0.9	39.4	53.9	65.2
Local and interurban passenger	2.1	2.0	2.0	5.7	8.3	10.1	9.0	12.2	13.0
Transportation services	0.7	0.7	0.7	1.6	2.1	2.5	17.8	23.2	25.5
Communications	15.2	15.4	16.1	2.9	4.4	4.7	146.6	193.3	207.5
Utilities	17.8	20.9	21.7	3.3	3.3	3.5	159.3	197	204.9
Commerce	62.9	58.3	60.5	48.4	42.2	51.5	870.8	1,132.4	1,192.8
Wholesale trade	29.3	28.6	30.0	U	U	U	367.3	491.4	519.8
Retail trade	33.6	29.7	30.5	U	U	U	503.5	641.0	673.0
Finance, insurance and real estate	88.2	97.3	101.4	29.1	34.0	38.0	1,025.2	1,362.3	1,448.6
Services	120.9	124.2	128.7	47.0	62.3	67.7	1,059.4	1,445.4	1,544.2
Government	47.2	46.0	45.7	6.9	9.4	10.0	792.5	962.7	993.7

**KEY:** p = Data are preliminary. U = Data are unavailable.

## NOTES

### All Countries

Industry Classification: The industry groupings included in this table are based on a modification of the 1987 U.S. Standard Industrial Classification (SIC) system. The North American Industry Classification System (NAICS), which went into effect for the reference year 1997 in Canada and the United States and in 1998 in Mexico, differs from the system used in this table. NAICS industry categories will allow for greater data comparability and consistency across the three countries.

Pipeline, excluding natural gas: For Canada and the United States, oil pipelines are included. Oil pipeline data for Mexico are included in both manufacturing and mining and cannot be separated from these categories.

Utilities: Include electricity, natural gas, water, sanitation and other utility services.

Transportation services: Includes services of travel agencies, tour operators, freight forwarders and brokers, rental services and other miscellaneous types of transportation services.

### United States

Total: The GDP total does not equal the sum of industry categories due to the statistical discrepancy reported in the source data but omitted in this table. For the exact amounts of these, see Appendix B.

## SOURCES

### Canada

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1999).

### Mexico

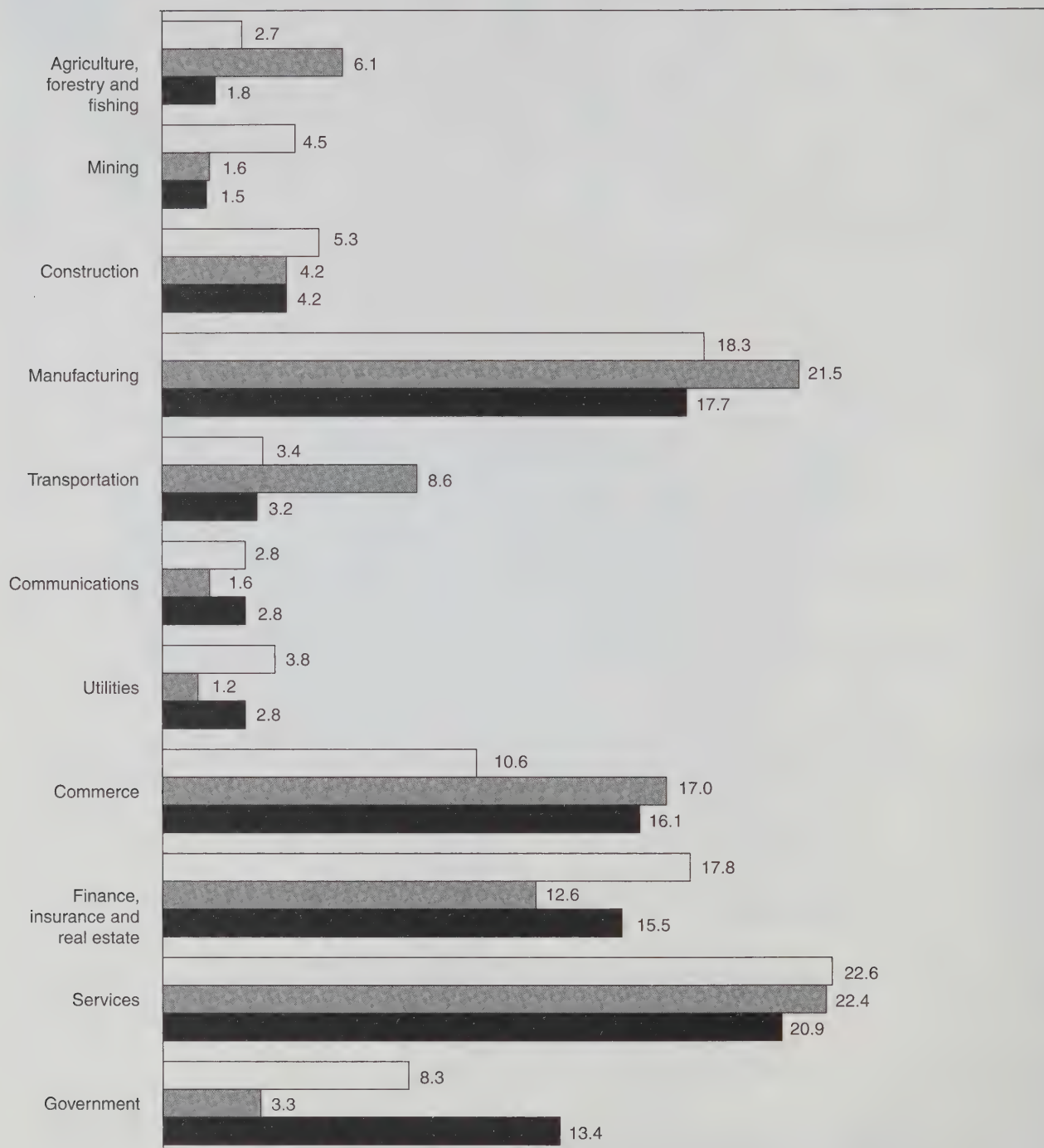
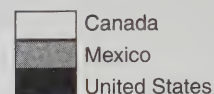
Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Agu: 1997).

### United States

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. (Washington, DC: August 1996 and January 1999).

**figure** 1-3a

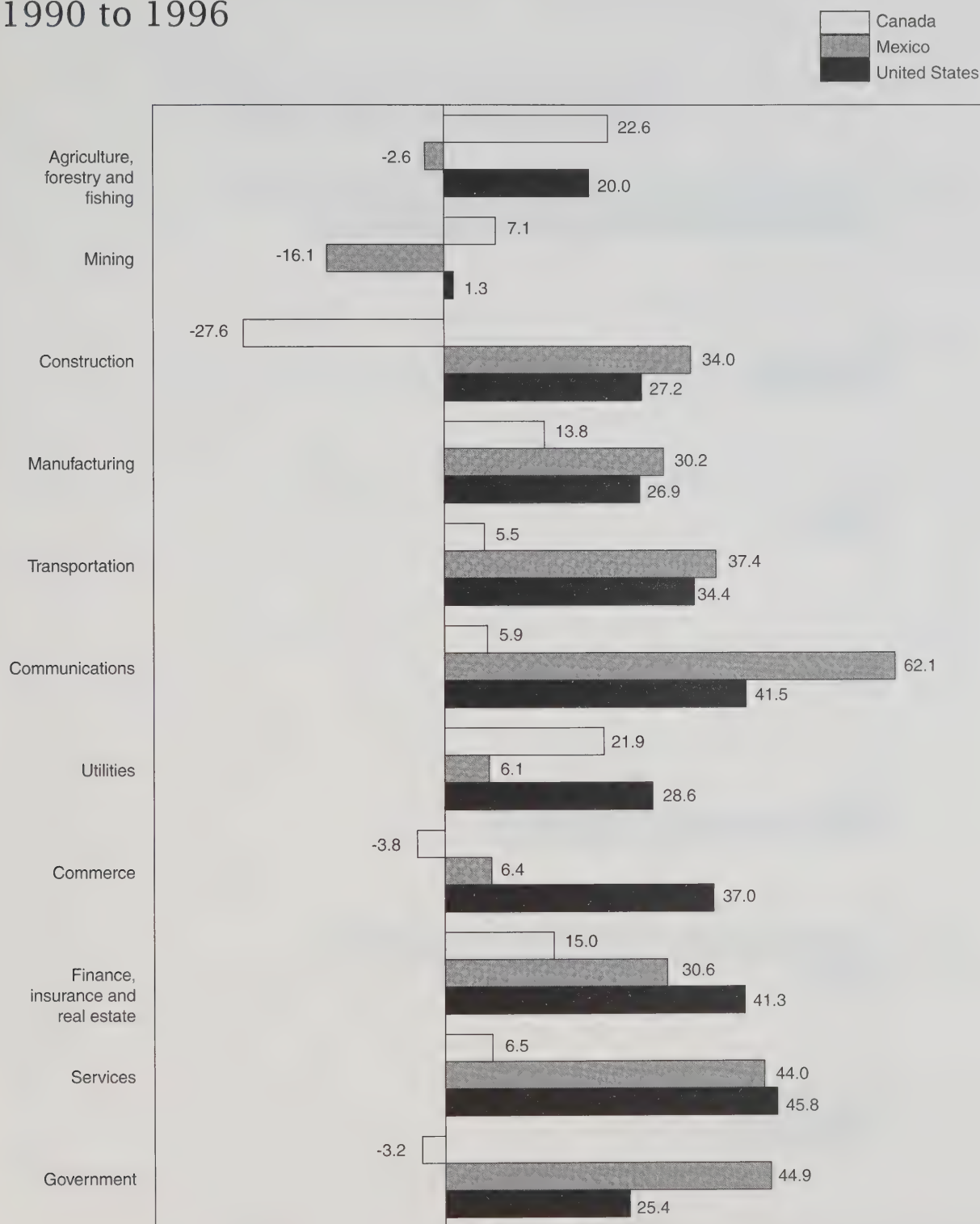
## Percent Share of GDP Industry Category: 1996



Notes and sources: See Table 1-3.

**figure 1-3b**

# Percent Change in GDP Industry Category: 1990 to 1996



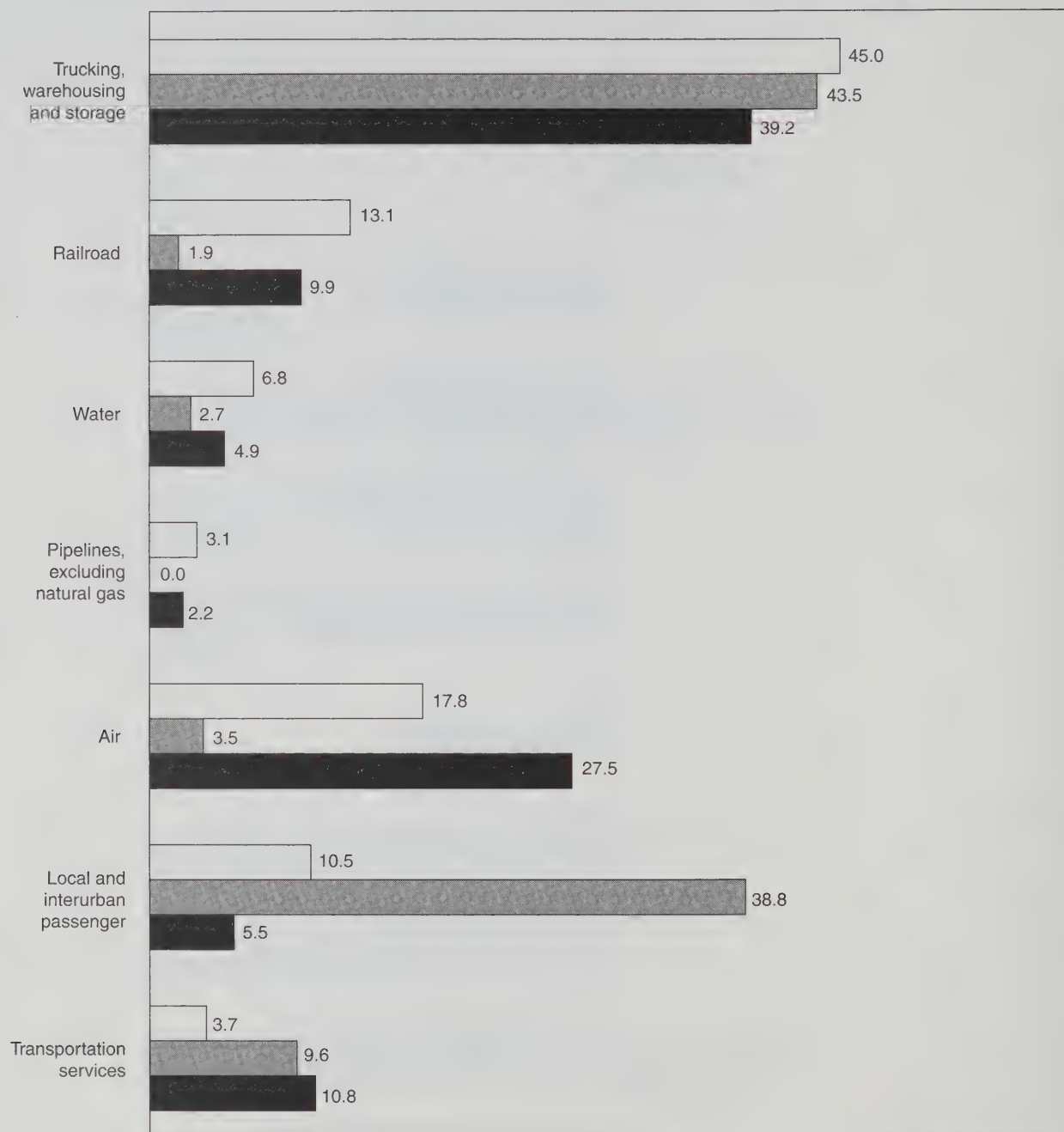
Notes and sources: See Table 1-3.



**figure 1-3c**

## Percent Share of Transportation Industry GDP by Subcategory: 1996

Canada  
Mexico  
United States



Pipeline, excluding natural gas.

Data for Mexico are included in both manufacturing and mining GDP industries, and cannot be separated from these categories.

Notes and sources: See Table 1-3.

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section 2

# Transportation and the Economy





# Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand

(Current value, billions (or thousand millions) of U.S. dollars)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995 <sup>r</sup>	1996
<b>Personal consumption of transportation, total</b>	<b>48.1</b>	<b>45.4</b>	<b>49.1</b>	<b>24.7</b>	<b>26.1</b>	<b>32.2</b>	<b>462.5</b>	<b>574.1</b>	<b>612.0</b>
Road motor vehicles and parts <sup>a</sup>	21.4	20.7	23.0	7.7	6.3	8.2	204.6	247.4	256.4
Motorcycles and other	0.9	0.8	0.8	U	U	U	5.0	7.9	8.7
Motor fuel and lubricants	11.2	10.0	10.5	5.8	5.0	6.0	109.3	115.6	124.5
Transport services	14.6	13.9	14.8	11.2	14.8	18.1	143.6	203.2	222.4
<b>Gross private domestic investment, total</b>	<b>12.4</b>	<b>11.1</b>	<b>11.8</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>78.5</b>	<b>130.6</b>	<b>142.6</b>
Transportation structures	2.3	1.8	2.3	U	U	U	3.0	4.4	5.4
Transportation equipment	10.1	9.3	9.5	U	U	U	75.5	126.2	137.2
<b>Exports (+), total</b>	<b>39.7</b>	<b>58.9</b>	<b>61.3</b>	<b>6.3</b>	<b>14.6</b>	<b>19.5</b>	<b>106.7</b>	<b>133.6</b>	<b>143.2</b>
Aircraft, engines and parts	4.2	4.7	5.5	0.1	0.3	0.1	32.2	26.1	30.8
Road motor vehicles, engines and parts	32.1	49.3	50.5	4.8	12.4	17.0	36.5	61.8	65.0
Passenger fares	1.5	1.7	1.9	0.4	0.7	0.8	15.3	18.9	20.4
Other transportation	1.9	3.2	3.4	1.0	1.2	1.6	22.7	26.8	27
<b>Imports (-), total</b>	<b>35.8</b>	<b>47.9</b>	<b>49.4</b>	<b>9.7</b>	<b>12.2</b>	<b>13.5</b>	<b>134.7</b>	<b>176.6</b>	<b>185.1</b>
Aircraft, engines and parts	2.8	2.9	3.6	0.1	0.0	0.1	10.5	10.7	12.7
Road motor vehicles, engines and parts	29.6	40.8	41.3	5.8	7.6	8.4	88.5	123.8	128.9
Passenger fares	2.7	2.8	3.1	0.5	0.4	0.6	10.5	14.7	15.8
Other transportation	0.7	1.4	1.4	3.3	4.1	4.4	25.2	27.4	27.7
<b>Net exports of transportation-related goods and services</b>	<b>3.9</b>	<b>11.0</b>	<b>11.9</b>	<b>-3.4</b>	<b>2.4</b>	<b>6.0</b>	<b>-28.0</b>	<b>-43.0</b>	<b>-41.9</b>
<b>Government transportation-related purchases, total</b>	<b>7.7</b>	<b>7.1</b>	<b>6.4</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>110.6</b>	<b>136.6</b>	<b>143.3</b>
Federal purchases	0.6	0.3	0.2	U	U	U	14.6	18.1	18.9
State/province and local purchases	5.7	5.7	5.3	U	U	U	87.1	110.0	115.5
Defense related purchases	1.4	1.1	0.9	U	U	U	8.9	8.5	8.9
<b>Transportation-related final demand, total</b>	<b>72.0</b>	<b>74.6</b>	<b>79.2</b>	<b>22.7</b>	<b>30.0</b>	<b>40.2</b>	<b>623.6</b>	<b>798.3</b>	<b>856.0</b>
<b>Gross domestic product</b>	<b>540.1</b>	<b>545.9</b>	<b><sup>p</sup>568.7</b>	<b>240.4</b>	<b>261.5</b>	<b>302.2</b>	<b>5,743.8</b>	<b>7,269.6</b>	<b>7,661.6</b>
<b>Transportation in GDP, total (percent)</b>	<b>13.4</b>	<b>13.6</b>	<b>13.9</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>10.9</b>	<b>11.0</b>	<b>11.2</b>

<sup>a</sup>Excludes boats, noncommercial trailers and aircraft.

KEY: p = Data are preliminary. r = Data are revised. U = Data are unavailable.

## NOTES

### Mexico

Road motor vehicles and parts: Data include motorcycles which cannot be disaggregated into a separate category.

Motorcycles and other: Data are unavailable as motorcycles are included in the category, road motor vehicles and parts and cannot be further disaggregated.

Transportation related final demand: Excludes data for government purchases and gross private domestic investment.

Transportation in GDP: The total percent of transportation in GDP was not calculated due to the unavailability of data for government and private sector purchases.

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**t a b l e 2-1****Gross Domestic Product (GDP) Attributed to  
Transportation-Related Final Demand—Continued****SOURCES****Canada**

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Ags: 1997).

**United States**

U.S. Department of Transportation. Bureau of Transportation Statistics, April 1999 based on data from the U.S. Department of Commerce. Bureau of Economic Analysis. *Historical Data Tables*. (Washington, DC: 1990).

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business* and special tabulations. (Washington, DC: 1998).

# Personal Consumption Expenditures on Transportation by Subcategory of Expenditure

(Current value, millions of U.S. dollars)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995 <sup>r</sup>	1996
<b>Transportation, total</b>	<b>48,100</b>	<b>45,700</b>	<b>49,300</b>	<b>24,673</b>	<b>26,110</b>	<b>32,241</b>	<b>462,500</b>	<b>574,100</b>	<b>612,000</b>
<b>User-operated transportation, total<sup>a</sup></b>	<b>40,100</b>	<b>38,200</b>	<b>41,500</b>	<b>13,437</b>	<b>11,334</b>	<b>14,170</b>	<b>426,200</b>	<b>531,800</b>	<b>567,600</b>
Personal road motor vehicles, new and used	18,500	17,900	20,100	3,623	1,726	3,252	180,200	219,100	226,600
New and used passenger cars	14,500	13,600	14,800	U	U	U	124,000	139,600	141,600
New and used trucks	3,100	3,500	4,500	U	U	U	51,200	71,600	76,300
New and used motorcycles and other motor vehicles	900	800	800	U	U	U	5,000	7,900	8,700
Parts and accessories of road motor vehicles	3,800	3,700	3,800	3,777	4,299	4,596	29,400	36,200	38,500
Repair and rental	4,600	4,200	4,300	283	284	308	87,300	128,700	143,700
Repair	4,100	3,900	4,000	U	U	U	73,500	92,400	98,000
Rental	500	300	300	U	U	U	13,800	36,300	45,700
Motor fuel and lubricants	11,200	10,000	10,500	5,753	5,024	6,015	109,300	115,600	124,500
Tolls	100	100	100	U	U	U	2,000	2,800	2,800
Insurance premium, less claims paid	1,900	2,300	2,700	U	U	U	18,000	29,400	31,500
<b>Purchased intercity transportation, total</b>	<b>6,500</b>	<b>6,000</b>	<b>6,300</b>	<b>5,362</b>	<b>8,748</b>	<b>10,791</b>	<b>28,500</b>	<b>33,100</b>	<b>34,400</b>
Intercity passenger rail	200	100	100	31	9	11	800	800	800
Intercity bus	300	200	200	3,118	6,983	8,316	1,000	1,100	1,100
Air	4,300	4,000	4,200	1,473	1,017	1,484	23,900	27,900	28,500
Other	1,700	1,700	1,800	740	739	978	2,800	3,300	4,000
<b>Purchased local and suburban transportation, total</b>	<b>1,500</b>	<b>1,500</b>	<b>1,500</b>	<b>5,874</b>	<b>6,029</b>	<b>7,280</b>	<b>7,800</b>	<b>9,200</b>	<b>10,000</b>
Mass transit system	1,100	1,100	1,100	1,551	1,367	1,801	5,200	6,000	6,500
Taxi	400	400	400	4,323	4,662	5,479	2,600	3,200	3,500

<sup>a</sup>Excludes motor vehicles used primarily for recreation.

**KEY:** r = Data are revised. U = Data are unavailable.

## NOTES

### All Countries

Purchased local and suburban transportation, mass transit system: Includes purchases for subway, local bus and other transit fares.

### Mexico

Data refer to household spending.

## SOURCES

### Canada

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1998).

### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Agu: 1997).

### United States

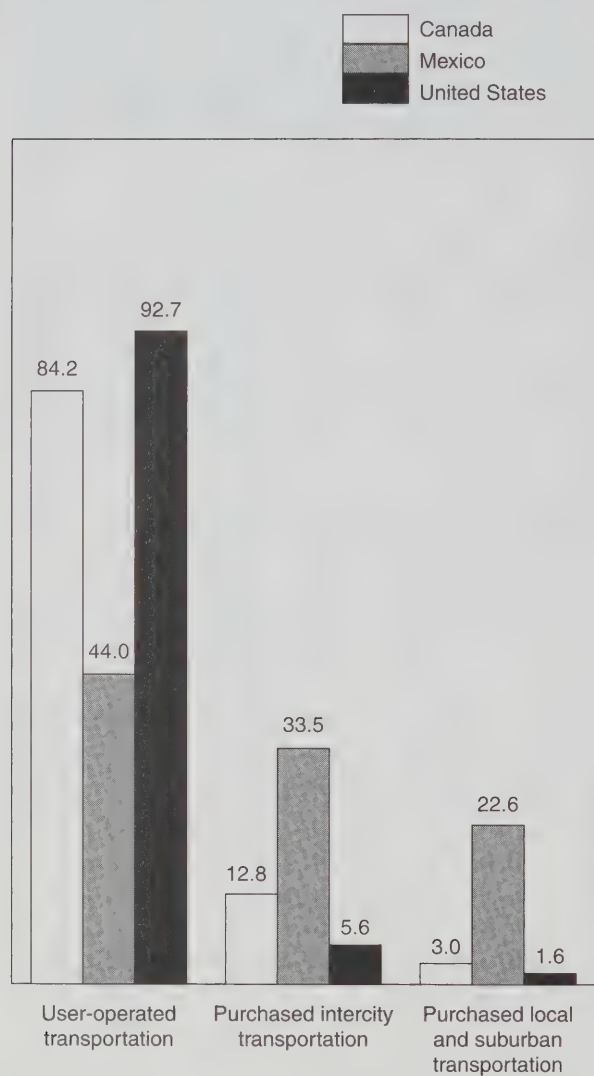
U.S. Department of Transportation. Bureau of Transportation Statistics, April 1999 based on data from the U.S. Department of Commerce. Bureau of Economic Analysis. *Historical Data Tables*. (Washington, DC: 1990).

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business* and special tabulations. (Washington, DC: 1998).



**figure 2-2a**

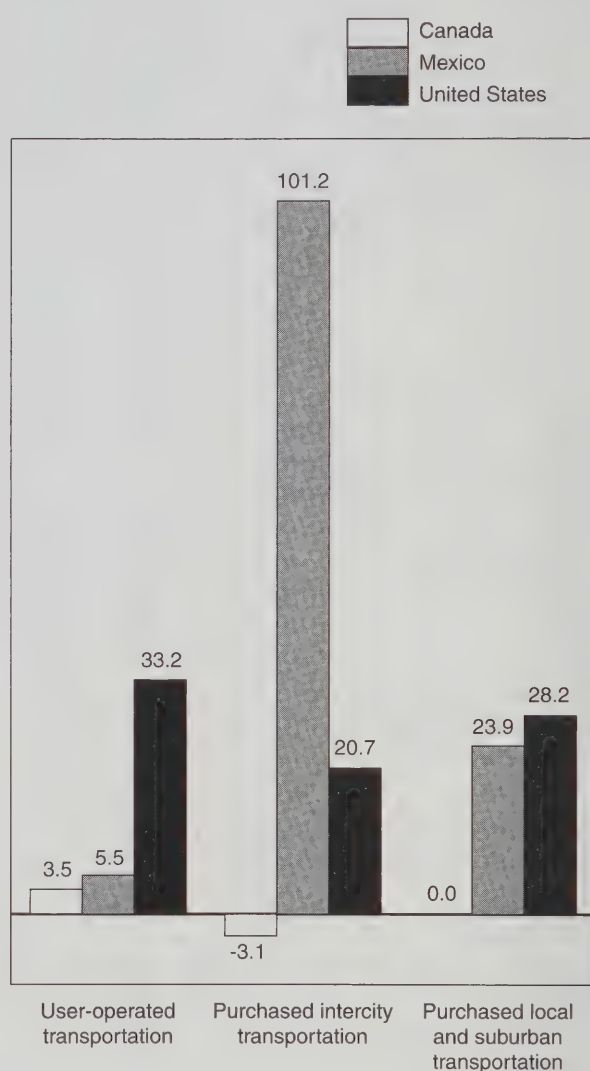
# Percent Share of Personal Consumption Expenditures for Transportation by Major Subcategory: 1996



Notes and sources: See Table 2-2.

**figure 2-2b**

# Percent Change in Personal Consumption Expenditures for Transportation by Major Subcategory: 1990 to 1996



Notes and sources: See Table 2-2.

table 2-3

Government Expenditures for Transportation by Mode<sup>a</sup>

(Current value, millions of U.S. dollars)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Government<sup>a</sup> expenditures, total</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>96,404.0</b>	<b>123,073.2</b>	<b>124,531.5</b>
<b>Air</b>	<b>1,433.8</b>	<b>1,155.6</b>	<b>1,216.7</b>	<b>136.5</b>	<b>210.0</b>	<b>171.0</b>	<b>10,983.0</b>	<b>14,209.5</b>	<b>14,222.8</b>
Infrastructure	N	N	N	52.2	39.6	54.5	3,111.0	3,289.1	3,317.5
Equipment	N	N	N	0.0	0.0	0.0	988.0	1,392.3	1,364.1
Current operations	N	N	N	84.3	170.4	116.5	6,884.0	9,528.1	9,541.2
<b>Water transport</b>	<b>397.8</b>	<b>233.5</b>	<b>330.5</b>	<b>157.1</b>	<b>70.8</b>	<b>93.1</b>	<b>4,294.0</b>	<b>4,813.4</b>	<b>4,878.0</b>
Infrastructure	N	N	N	46.5	41.1	49.1	968.0	958.1	1,030.4
Equipment	N	N	N	46.8	0.0	0.0	341.0	648.5	639.4
Current operations	N	N	N	63.8	29.7	44.0	2,985.0	3,206.8	3,208.2
<b>Pipeline, oil and gas</b>	<b>6.1</b>	<b>2.6</b>	<b>0.0</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>27</b>	<b>42</b>	<b>46</b>
Infrastructure	N	N	N	U	U	U	NA	NA	NA
Equipment	N	N	N	U	U	U	NA	NA	NA
Current operations	N	N	N	U	U	U	NA	NA	NA
<b>Rail</b>	<b>1,607.8</b>	<b>1,518.3</b>	<b>414.1</b>	<b>1,023.4</b>	<b>519.8</b>	<b>585.2</b>	<b>541.0</b>	<b>1,043.0</b>	<b>1,189.0</b>
Infrastructure	N	N	N	460.6	256.0	186.6	U	U	U
Equipment	N	N	N	14.1	179.5	180.1	U	U	U
Current operations	N	N	N	548.7	84.3	218.5	U	U	U
Intercity passenger rail	N	N	N	U	U	U	U	U	U
Freight rail	N	N	N	U	U	U	NA	NA	NA
<b>Transit rail</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>18,788.0</b>	<b>25,201.8</b>	<b>25,777.5</b>
Infrastructure	N	N	N	U	U	U	2,891.0	5,393.3	6,155.6
Equipment	N	N	N	U	U	U	2,552.0	2,113.9	1,828.0
Current operations	N	N	N	U	U	U	13,345.0	17,694.6	17,793.9
<b>Road</b>	<b>10,154.5</b>	<b>8,902.5</b>	<b>8,595.4</b>	<b>654.9</b>	<b>892.2</b>	<b>1,295.3</b>	<b>61,771.0</b>	<b>77,763.5</b>	<b>78,418.2</b>
Infrastructure	N	N	N	613.6	826.0	1,204.9	29,502.0	37,445.8	37,964.0
Equipment	N	N	N	0.0	0.0	0.0	4,546.0	5,425.4	5,418.0
Current operations	N	N	N	41.3	66.2	90.4	27,723.0	34,892.3	35,036.2

<sup>a</sup>Government refers to local, state or provincial and federal levels of government, unless otherwise noted.

KEY: N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

## NOTES

## Mexico

Road: Includes federal government expenditures on Mexico's federal highways.

## United States

Total: Data represent the sum of the subcategories in this table.

Pipeline and freight rail: Detailed subcategory data are not applicable because expenditures for these two modes are primarily by the private sector.

Intercity passenger rail: Federal payments to the National Railroad Passenger Corporation (Amtrak) were \$806 million in 1995, according to the 1997 U.S. budget. These payments are not included in this table because, as subsidies, they do not fall into any of the three expenditure categories in the table.

Government Expenditures for Transportation by Mode<sup>a</sup>—Continued

## SOURCES

## Canada

Statistics Canada. Public Institutions Division. Special tabulations. (Ottawa, Ont.: 1999).

## Mexico

1990: Secretaría de Programación y Presupuesto. *Cuenta de la Hacienda Pública Federal, 1990*. (Mexico City, D.F.: 1991).

1995-96: Secretaría de Hacienda y Crédito Público. *Cuenta de la Hacienda Pública Federal, 1995 and 1996*. (Mexico City, D.F.: 1996 and 1997).

## United States

U.S. Department of Transportation, Bureau of Transportation Statistics, April 1999 based on data from the U.S. Department of Commerce. U.S. Census Bureau. *Government Finances: 1989-90*. (Washington, DC: 1990).

U.S. Department of Commerce. U.S. Census Bureau. Web site: [www.census.gov/govs](http://www.census.gov/govs)

U.S. Department of Transportation, Bureau of Transportation Statistics. *Government Transportation Financial Statistics*. (Washington, DC: 1997).



**t a b l e 2-4**

# Employment in Transportation and Related Industries

(Thousands of employees)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Employed labor force, total</b>	<b>11,369</b>	<b>10,876</b>	<b>10,967</b>	<b>25,958</b>	<b>27,348</b>	<b>28,282</b>	<b>118,793</b>	<b>124,900</b>	<b>126,708</b>
<b>Transportation labor force</b>	<b>1,176</b>	<b>1,051</b>	<b>1,068</b>	<b>1,652</b>	<b>1,741</b>	<b>1,910</b>	<b>9,685</b>	<b>9,579</b>	<b>10,125</b>
<b>Transport sectors</b>	<b>500</b>	<b>447</b>	<b>442</b>	<b>1,332</b>	<b>1,407</b>	<b>1,513</b>	<b>3,293</b>	<b>3,636</b>	<b>4,034</b>
Air	61	53	56	23	20	21	745	788	1,122
Trucking, warehousing and storage	158	152	159	553	553	608	1,391	1,583	1,641
Trucking	145	136	141	536	536	593	1,274	1,440	1,484
Warehousing and storage	13	16	18	17	17	15	117	143	152
Local and intercity passenger transport	92	77	77	589	673	709	338	424	440
Intercity and rural	<sup>e</sup> 4	<sup>e</sup> 4	<sup>e</sup> 3	117	154	160	26	24	26
Local and suburban transit systems	<sup>e</sup> 23	<sup>e</sup> 17	<sup>e</sup> 16	122	124	135	141	203	217
School bus	<sup>e</sup> 39	<sup>e</sup> 39	<sup>e</sup> 38	U	U	U	111	134	133
Taxi	N	N	N	350	395	414	32	32	31
Other local and intercity	<sup>e</sup> 3	<sup>e</sup> 2	<sup>e</sup> 3	U	U	U	28	31	33
Railroad	69	53	51	35	19	20	279	239	231
Water	17	18	18	34	29	28	177	174	173
Pipeline	9	8	7	U	U	U	18	15	15
Transportation services	107	102	92	98	113	127	345	413	417
<b>Transportation vehicle and equipment manufacturing</b>	<b>243</b>	<b>230</b>	<b>247</b>	<b>255</b>	<b>215</b>	<b>229</b>	<b>2,539</b>	<b>2,460</b>	<b>2,464</b>
Aircraft and parts	45	37	40	6	5	5	712	449	460
Road motor vehicles, equipment, parts and accessories	150	154	160	193	176	188	1,278	1,563	1,565
Road motor vehicles and equipment	50	53	54	U	U	U	812	968	963
Parts and accessories, road motor vehicles	87	88	92	N	N	N	400	516	530
Truck, bus bodies and trailers	13	13	14	N	N	N	66	79	73
Railroad equipment	7	10	9	28	14	14	33	37	36
Ship/boat building and repair	17	7	10	5	2	4	188	159	157
Tires and tubes	22	22	24	16	13	14	84	80	80
Other transportation equipment	2	C	4	7	5	5	244	172	166
<b>Related industries, total<sup>a</sup></b>	<b>420</b>	<b>358</b>	<b>379</b>	<b>65</b>	<b>119</b>	<b>169</b>	<b>3,180</b>	<b>3,382</b>	<b>3,523</b>
Auto repair services	71	70	70	U	U	U	914	1,020	1,084
Gasoline service stations	113	69	65	U	U	U	647	647	670
Highway and street construction	65	47	51	65	119	169	239	227	235
Road motor vehicle wholesalers	61	64	65	U	U	U	456	492	502
New and used car and light truck dealers	110	108	110	U	U	U	924	996	1,032
<b>Government employment, total</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>673</b>	<b>101</b>	<b>99</b>
Federal departments of transportation	<sup>e</sup> 21	<sup>e</sup> 19	<sup>e</sup> 13	47	42	<sup>b</sup> 75	104	101	99
State/province and local	N	N	N	U	U	U	569	U	U

# Employment in Transportation and Related Industries—Continued

<sup>a</sup>Employment data for related industries includes nontransportation occupations.

<sup>b</sup>Mexican data for 1996 includes part-time positions for work on the rural road program of the Secretaría de Comunicaciones y Transportes.

**KEY:** e = Data are estimated. C = Data are confidential. N = Data are nonexistent. U = Data are unavailable.

## NOTES

### All Countries

Data are based on annual averages. U.S. and Canadian data are based on the number of employees. Mexican data are based on the number of full-time positions.

### Mexico

Federal Departments of Transportation: Labor force includes number of positions in the area of communications and in the area of transportation for the Secretaría de Comunicaciones y Transportes. It is not possible to further separate the Secretaría de Comunicaciones y Transportes employment data.

## SOURCES

### Canada

Statistics Canada. *Employment, Earnings and Hours—Payrolls and Hours, Catalogue No. 72-002-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue No. 53-215-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Transport Canada. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988 - 1996*. (Aguascalientes, Agu.: 1997).

Poder Ejecutivo Federal. *Informe de Gobierno, various years*. (Mexico City, D.F.: various years).

### United States

Employed labor force, total: U.S. Department of Labor. Bureau of Labor Statistics. *Household Data Annual Averages, 1998*.

Web site: [www.stats.bls.gov](http://www.stats.bls.gov)

Private employment (Transport sectors, transportation vehicle and equipment manufacturing and related industries): U.S. Department of Transportation. Bureau of Transportation Statistics, April 1999, special tabulation based on data from:

U.S. Department of Labor. Bureau of Labor Statistics. *National Employment, Hours and Earnings, United States, 1988-1996*. (Washington, DC: various years).

U.S. Department of Labor. Bureau of Labor Statistics. *National Employment, Hours and Earnings, United States, June 1997*. (Washington, DC: 1997).

Government employment: U.S. Department of Transportation. Office of the Secretary. *DOT Workforce Facts and DOT Employment Facts*. (Washington, DC: various years).

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States: 1998*. (Washington, DC: 1998).

table 2-5

# Employment in Transportation-Related Occupations

(Thousands of employees)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Employed labor force, total</b>	<b>11,276</b>	<b>11,370</b>	<b>11,410</b>	<b>25,958</b>	<b>27,348</b>	<b>28,282</b>	<b>118,793</b>	<b>124,900</b>	<b>126,708</b>
<b>Workers in transportation occupations, total</b>	<b>418</b>	<b>430</b>	<b>429</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>3,980</b>	<b>4,258</b>	<b>4,406</b>
<b>Transportation occupations (percent of total national labor force)</b>	<b>3.7</b>	<b>3.8</b>	<b>3.8</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>3.4</b>	<b>3.4</b>	<b>3.5</b>
<b>Road motor vehicle operators, total</b>	<b>351</b>	<b>368</b>	<b>374</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>3,560</b>	<b>3,850</b>	<b>3,978</b>
Supervisors	7	8	7	N	N	N	76	87	85
Truck drivers	234	224	237	N	N	N	2,627	2,860	3,019
Drivers-sales workers	N	N	N	N	N	N	201	158	156
Bus drivers	57	66	61	N	N	N	443	526	512
Taxi cab drivers and chauffeurs	18	17	16	350	395	414	208	211	203
Other	35	53	53	N	N	N	5	8	4
<b>Rail transportation, total</b>	<b>24</b>	<b>23</b>	<b>18</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>118</b>	<b>104</b>	<b>116</b>
Supervisors	6	2	2	N	N	N	N	N	N
Conductors and yardmasters	7	8	7	N	N	N	36	33	45
Locomotive operations	6	8	6	N	N	N	46	51	49
Operating support	4	4	2	N	N	N	28	17	15
Other	C	C	C	N	N	N	8	3	7
<b>Water transportation, total</b>	<b>17</b>	<b>14</b>	<b>12</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>52</b>	<b>66</b>	<b>70</b>
Deck officers, captains and mates	6	4	5	N	N	N	26	33	32
Deck crew	3	4	3	N	N	N	18	26	25
Engineering officers	4	2	C	N	N	N	2	3	8
Bridge, lock and lighthouse	N	N	N	N	N	N	6	4	5
Other	3	4	2	N	N	N	N	N	N
<b>Air transportation, total</b>	<b>21</b>	<b>20</b>	<b>20</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>250</b>	<b>238</b>	<b>241</b>
Airplane pilots and navigators	10	11	10	N	N	N	114	114	114
Operating support	8	7	6	N	N	N	136	124	127
Air traffic controllers	N	N	N	N	N	N	36	30	32
Service and flight attendants	N	N	N	N	N	N	100	94	95
Other	3	3	3	N	N	N	N	N	N
<b>Other transport operating</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>

**KEY:** C = Data are confidential. N = Data are nonexistent. NA = Not applicable.

**NOTE:** Canadian and U.S. employment data are based on annual averages and represent the number of employees.



## table 2-5

### Employment in Transportation-Related Occupations—Continued

#### SOURCES

##### Canada

Statistics Canada. *Historical Labor Force Statistics, Catalogue No. 71-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

##### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Mexico City, D.F.: 1997).

##### United States

Employed labor force: U.S. Department of Labor. Bureau of Labor Statistics. *Household Data Annual Averages*.

Web site: [www.stats.bls.gov](http://www.stats.bls.gov)

Transportation occupations: U.S. Department of Transportation. Bureau of Transportation Statistics, based on data from the U.S. Department of Labor. Bureau of Labor Statistics. *Employment and Earnings* and BLS underlying statistical details. (Washington, DC: various years).

**t a b l e 2-6**

# Receipts and Payments Related to International Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Receipts from exports</b>									
<b>Merchandise exports, total</b>	<b>127,687</b>	<b>191,130</b>	<b>202,300</b>	<b>40,711</b>	<b>79,542</b>	<b>96,000</b>	<b>392,924</b>	<b>584,743</b>	<b>625,075</b>
Inland freight	3,668	5,049	4,955	U	U	U	N	N	N
Other trade adjustments	-1,028	-3,200	-2,083	U	U	U	-3,617	-8,803	-13,006
Trade adjustments, total	2,640	1,848	2,872	U	U	U	-3,617	-8,803	-13,006
<b>Export merchandise trade   (balance of payments)</b>	<b>130,327</b>	<b>192,979</b>	<b>205,172</b>	<b>40,711</b>	<b>79,542</b>	<b>96,000</b>	<b>389,307</b>	<b>575,940</b>	<b>612,069</b>
<b>Service exports, total</b>	<b>19,210</b>	<b>26,396</b>	<b>29,336</b>	<b>15,360</b>	<b>17,488</b>	<b>19,494</b>	<b>147,571</b>	<b>210,596</b>	<b>236,768</b>
<b>Transportation</b>	<b>4,223</b>	<b>5,240</b>	<b>5,703</b>	<b>893</b>	<b>1,164</b>	<b>1,412</b>	<b>36,655</b>	<b>44,743</b>	<b>45,768</b>
Air	893	875	925	U	U	U	8,174	10,015	10,564
Land <sup>a</sup>	990	1,673	1,945	U	U	U	1,264	2,091	2,212
Water	1,309	1,432	1,368	U	U	U	11,919	13,512	12,435
Passenger fares	1,032	1,260	1,465	441	668	775	15,298	19,125	20,557
<b>Tourism and other services</b>	<b>14,987</b>	<b>21,156</b>	<b>23,633</b>	<b>14,467</b>	<b>16,324</b>	<b>18,082</b>	<b>110,916</b>	<b>165,851</b>	<b>191,000</b>
Tourism	6,360	7,911	8,614	5,526	6,179	6,934	U	U	U
Other services	8,627	13,245	15,019	8,941	10,145	11,148	U	U	U
<b>Receipts, total</b>	<b>149,538</b>	<b>219,343</b>	<b>234,497</b>	<b>56,071</b>	<b>97,029</b>	<b>115,493</b>	<b>536,878</b>	<b>786,534</b>	<b>848,837</b>
<b>Payments for imports</b>									
<b>Merchandise imports, total</b>	<b>116,738</b>	<b>164,364</b>	<b>170,670</b>	<b>41,593</b>	<b>72,453</b>	<b>89,469</b>	<b>495,980</b>	<b>743,445</b>	<b>795,289</b>
Inland freight	3,236	3,173	3,395	U	U	U	2,264	3,350	3,595
Other trade adjustments	842	23	394	U	U	U	93	2,569	4,355
Trade adjustments, total	4,078	3,196	3,789	U	U	U	2,357	5,919	7,950
<b>Merchandise import trade   (balance of payments)</b>	<b>120,817</b>	<b>167,560</b>	<b>174,459</b>	<b>41,593</b>	<b>72,453</b>	<b>89,469</b>	<b>498,337</b>	<b>749,364</b>	<b>803,239</b>
<b>Services, total</b>	<b>28,303</b>	<b>33,844</b>	<b>36,135</b>	<b>21,929</b>	<b>26,153</b>	<b>28,355</b>	<b>118,826</b>	<b>142,230</b>	<b>156,634</b>
<b>Transportation</b>	<b>5,786</b>	<b>8,042</b>	<b>8,121</b>	<b>1,132</b>	<b>1,449</b>	<b>1,669</b>	<b>34,880</b>	<b>41,772</b>	<b>43,446</b>
Air	906	1,112	1,268	U	U	U	9,881	11,064	11,679
Land <sup>a</sup>	884	1,546	1,578	U	U	U	2,004	2,590	2,831
Water	1,964	2,987	2,773	U	U	U	12,464	13,685	13,160
Passenger fares	2,031	2,398	2,502	475	416	576	10,531	14,433	15,776
<b>Tourism and other services</b>	<b>22,518</b>	<b>25,801</b>	<b>28,014</b>	<b>19,266</b>	<b>22,730</b>	<b>24,179</b>	<b>83,946</b>	<b>100,458</b>	<b>113,188</b>
Tourism	10,931	10,170	11,084	5,519	3,171	3,387	U	U	U
Other services	11,587	15,631	16,930	13,747	19,559	20,789	U	U	U
<b>Payments, total</b>	<b>149,118</b>	<b>201,363</b>	<b>210,577</b>	<b>63,522</b>	<b>98,606</b>	<b>117,824</b>	<b>617,163</b>	<b>891,594</b>	<b>959,873</b>
<b>Balance</b>	<b>420</b>	<b>17,980</b>	<b>23,920</b>	<b>-7,451</b>	<b>-1,577</b>	<b>-2,331</b>	<b>-80,285</b>	<b>-105,060</b>	<b>-111,036</b>

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.

**KEY:** N = Data are nonexistent.    U = Data are unavailable.

**NOTE:** Detailed data on merchandise trade commodities can be found in Sections 6 and 7.

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**t a b l e 2-6****Receipts and Payments Related to International  
Merchandise and Services Trade**  
(Balance of Payments Basis)—*Continued***SOURCES****Canada**

Statistics Canada. *Canada's Balance of International Payments, Catalogue No. 67-001-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Banco de México. *Indicadores Económicos*. (Mexico City, D.F.: 1998).

**United States**

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. (Washington, DC: September 1993, July 1996 and October 1997).

U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).



**t a b l e** 2-7a

# Canada's Receipts From and Payments to Mexico for Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

	1990	1995	1996
<b>Receipts from exports to Mexico</b>			
Merchandise exports, total	562	835	922
Trade adjustments, total	NA	NA	NA
Export merchandise trade (balance of payments)	562	835	922
Services, total	71	105	159
Transportation	1	7	7
Air	NA	NA	NA
Land <sup>a</sup>	NA	NA	NA
Water	NA	NA	NA
Passenger fares	1	7	7
Tourism and other services	71	105	159
Tourism	42	48	59
Other services	29	57	100
<b>Receipts, total</b>	<b>634</b>	<b>947</b>	<b>1,088</b>
<b>Payments for imports from Mexico</b>			
Merchandise imports, total (customs-origin)	1,497	3,900	4,426
Merchandise imports, total (customs-consignment)	NA	2,471	2,723
Trade adjustments, total	NA	NA	NA
Import merchandise trade (balance of payments)	NA	2,471	2,723
Services, total	349	302	338
Transportation	8	4	6
Air	NA	NA	NA
Land <sup>a</sup>	NA	NA	NA
Water	NA	NA	NA
Passenger fares	8	4	6
Tourism and other services	349	302	338
Tourism	320	256	268
Other services	29	46	70
<b>Payments, total</b>	<b>NA</b>	<b>2,777</b>	<b>3,067</b>
<b>Balance</b>	<b>NA</b>	<b>-1,830</b>	<b>-1,979</b>

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.

**KEY:** NA = Not applicable.

**NOTE:** Detailed data on North American merchandise trade commodities can be found in Section 6.

**SOURCES**

Statistics Canada. *Canada's Balance of International Payments, Catalogue No. 67-001-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**t a b l e 2-7b**

# Canada's Receipts From and Payments to the United States for Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

	1990	1995	1996
<b>Receipts from exports to the United States</b>			
Merchandise exports, total	95,610	151,410	163,706
Trade adjustments, total	8	-1,547	-648
Export merchandise trade (balance of payments)	95,618	149,863	163,058
Services, total	10,783	15,101	16,759
Transportation	1,839	2,564	2,957
Air	275	283	323
Land <sup>a</sup>	990	1,673	1,945
Water	319	304	298
Passenger fares	256	304	392
Tourism and other services	8,944	12,537	13,801
Tourism	3,637	4,406	4,750
Other services	5,307	8,131	9,051
<b>Receipts, total</b>	<b>106,402</b>	<b>164,964</b>	<b>179,816</b>
<b>Payments for imports from the United States</b>			
Merchandise imports, total (customs-origin)	75,302	109,796	115,205
Merchandise Imports, total (customs-consignment)	79,959	122,364	128,551
Trade adjustments, total	3,584	3,306	3,602
Import merchandise trade (balance of payments)	83,544	125,670	132,154
Services, total	17,934	20,705	22,646
Transportation	2,418	3,200	3,318
Air	266	305	370
Land <sup>a</sup>	884	1,546	1,578
Water	376	251	251
Passenger fares	893	1,098	1,118
Tourism and other services	15,515	17,505	19,328
Tourism	7,529	6,591	7,235
Other services	7,987	10,914	12,093
<b>Payments, total</b>	<b>101,478</b>	<b>146,375</b>	<b>154,800</b>
<b>Balance</b>	<b>4,924</b>	<b>18,589</b>	<b>25,016</b>

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.

**NOTE:** Detailed data on North American merchandise trade commodities can be found in Section 6.

## SOURCES

Statistics Canada. *Canada's Balance of International Payments. Catalogue No. 67-001-XPB*. (Ottawa, Ont.: various years).  
Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**table 2-8a**

# U.S. Receipts From and Payments to Canada for Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

	1990	1995	1996
<b>Receipts from exports to Canada</b>			
Merchandise exports, total	83,674	127,226	134,210
Trade adjustments, total	-210	359	399
Export merchandise trade (balance of payments)	83,464	127,585	134,609
Services, total	16,605	18,247	19,951
Transportation	2,800	3,807	4,051
Air	290	346	420
Land <sup>a</sup>	1,259	2,087	2,208
Water	272	90	92
Passenger fares	979	1,284	1,331
Tourism and other services	13,805	14,440	15,900
Tourism	U	U	U
Other services	U	U	U
<b>Receipts, total</b>	<b>100,069</b>	<b>145,832</b>	<b>154,560</b>
<b>Payments for imports from Canada</b>			
Merchandise imports, total (customs value)	91,380	144,369	155,892
Trade adjustments, total	U	U	U
Import merchandise trade (balance of payments)	93,098	148,087	158,640
Services, total	102,464	134,523	143,086
Transportation	2,722	3,505	3,853
Air	246	325	388
Land <sup>a</sup>	2,004	2,590	2,831
Water	217	284	243
Passenger fares	255	306	391
Tourism and other services	99,742	131,018	139,233
Tourism	U	U	U
Other services	U	U	U
<b>Payments, total</b>	<b>195,562</b>	<b>282,610</b>	<b>301,726</b>
<b>Balance</b>	<b>-95,493</b>	<b>-136,778</b>	<b>-147,166</b>

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.

**KEY:** U = Data are unavailable.

**NOTE:** Detailed data on North American merchandise trade commodities can be found in Section 6.

## SOURCES

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*, September 1993, July 1996, and October 1997. (Washington, DC: various years).

U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).



**table 2-8b**

# U.S. Receipts From and Payments to Mexico for Merchandise and Services Trade (Balance of Payments Basis)

(Millions of current U.S. dollars)

	1990	1995	1996
<b>Receipts from exports to Mexico</b>			
Merchandise exports, total	28,279	46,292	56,792
Trade adjustments, total	-170	-110	-57
Export merchandise trade (balance of payments)	28,109	46,182	56,735
Services, total	7,880	7,294	7,927
Transportation	811	912	1,156
Air	267	258	321
Land <sup>a</sup>	5	4	4
Water	75	135	184
Passenger fares	464	515	647
Tourism and other services	7,069	6,382	6,771
Tourism	U	U	U
Other services	U	U	U
<b>Receipts, total</b>	<b>35,989</b>	<b>53,476</b>	<b>64,662</b>
<b>Payments for imports from Mexico</b>			
Merchandise imports, total (customs value)	30,157	62,101	74,297
Trade adjustments, total	U	U	U
Import merchandise trade (balance of payments)	30,509	62,361	75,108
Services, total	8,279	10,687	11,562
Transportation	905	1,047	1,140
Air	238	294	345
Land <sup>a</sup>	U	U	U
Water	102	184	177
Passenger fares	565	569	618
Tourism and other services	7,374	9,640	10,422
Tourism	U	U	U
Other services	U	U	U
<b>Payments, total</b>	<b>38,788</b>	<b>73,048</b>	<b>86,670</b>
<b>Balance</b>	<b>-2,799</b>	<b>-19,572</b>	<b>-22,008</b>

<sup>a</sup>Land refers to trucking, rail and pipeline services, unless otherwise noted.

KEY: U = Data are unavailable.

NOTE: Detailed data on North American merchandise trade commodities can be found in Section 6.

**SOURCES**U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*, September 1993, July 1996, and October 1997. (Washington, DC: various years).U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).

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s e c t i o n

3

# Transportation Safety





table 3-1

# Transportation Fatalities by Mode

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Fatalities, total</b>	<b>4,184</b>	<b>3,794</b>	<b>3,502</b>	<b>10,234</b>	<b>9,121</b>	<b>9,472</b>	<b>47,248</b>	<b>44,426</b>	<b>44,697</b>
<b>Air</b>	<b>99</b>	<b>117</b>	<b>75</b>	<b>24</b>	<b>30</b>	<b>86</b>	<b>864</b>	<b>963</b>	<b>1,089</b>
Air carriers	30	59	28	0	0	0	97	229	457
General aviation	69	58	47	24	30	86	767	734	632
<b>Road</b>	<b>3,963</b>	<b>3,351</b>	<b>3,091</b>	<b>10,201</b>	<b>9,043</b>	<b>9,305</b>	<b>44,599</b>	<b>41,817</b>	<b><sup>a</sup>42,065</b>
Passenger cars and light trucks	2,804	2,473	2,264	2,919	2,385	2,562	32,693	31,991	32,437
Passenger cars	U	U	U	U	U	U	24,092	22,423	22,505
Motorcycles	260	166	128	54	138	142	3,244	2,227	2,161
Buses	8	6	0	279	271	279	32	33	21
Large trucks	107	72	59	67	125	176	705	648	621
Pedestrians	584	416	460	1,388	1,038	1,111	6,482	5,584	5,449
Other	200	218	180	25	408	225	1,443	1,334	1,374
<b>Pipeline</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>9</b>	<b>21</b>	<b>53</b>
<b>Rail</b>	<b>103</b>	<b>120</b>	<b>119</b>	<b>9</b>	<b>48</b>	<b>81</b>	<b>1,297</b>	<b>1,146</b>	<b>1,039</b>
Grade crossing	48	53	47	U	U	U	698	579	488
Railroad	55	67	72	U	U	U	599	567	551
<b>Transit, total</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>339</b>	<b>274</b>	<b>264</b>
Transit rail	N	N	N	U	U	U	228	186	152
<b>Water transport</b>	<b>N</b>	<b>206</b>	<b>217</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>950</b>	<b>875</b>	<b>759</b>
Passenger vessels	N	195	210	N	N	N	U	U	U
Recreational boats	N	194	209	N	N	N	865	829	709
Commercial passenger vessels	6	1	1	N	N	N	U	U	U
Commercial freight vessels	13	11	7	N	N	N	U	U	U

<sup>a</sup>Includes two fatalities that have not been assigned by the National Highway Traffic Safety Administration to a subcategory.

**KEY:** N = Data are nonexistent. U = Data are unavailable.

## NOTES

### All Countries

**Fatalities, total:** For the United States, the number for total fatalities is less than the sum of the fatalities listed for individual modes because some fatalities are counted in more than one mode. That is, the United States has corrected for double counting in calculating total fatalities (see Appendix B). For Canada, the total shown is the sum of the modal totals and has not been corrected for double counting. (Note also, that Canadian fatality data for transit does not exist nor does Canadian fatality data for recreational boats for 1990. These data, if available, would increase the overall fatality totals for Canada.) For Mexico, the total is the sum of air, road and rail only, and therefore the total number of transportation fatalities is underrepresented.

**Air:** United States and Canada include fatalities from both passenger and all-cargo flights. Mexico includes fatalities from passenger flights only. For Canada and the United States, the air carrier data are for their own national flag carriers, operating both domestic and international flights.

**Road:** Data refer to occupants of the road motor vehicles listed. Other comprises pedalcyclists, other nonmotorists (except pedestrians, who are separately listed) and occupants of other or unknown motor vehicles.

**Road:** For road especially, it is important to note that the United States and Canada (except for the Province of Quebec) count all fatalities that occur within 30 days of the crash (and can be attributed to the crash), whereas Mexico counts those fatalities that occur at the site of the crash. See Appendix B, All Countries.

**Water transport:** United States and Canadian data are not comparable in several respects. See Appendix B, All Countries.

### Mexico

**Road:** Includes 5,469, 4,678 and 4,810 fatalities that occurred on the federal highway network in 1990, 1995 and 1996, respectively. These fatalities cannot be allocated to a specific vehicle category but are included in the road total.

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**table 3-1****Transportation Fatalities by Mode—Continued****SOURCES****Canada**

Air: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Road: Transport Canada. Road Safety and Motor Vehicle Regulation. *Traffic Accident Information Database*. Special tabulation. (Ottawa, Ont.: 1998).

Pipeline: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Rail: Transportation Safety Board of Canada (TSB). Minister of Public Works and Government Services. *TSB Statistical Summary: Railway Occurrences 1997*. (Ottawa, Ont.: 1998).

Water, commercial passenger and freight vessels: Transportation Safety Board of Canada (TSB). Minister of Public Works and Government Services. *TSB Statistical Summary: Marine Occurrences 1997*. (Ottawa, Ont.: 1998).

Water, recreational boats: Canadian Red Cross. Special tabulation. (Ottawa, Ont.: 1998).

**Mexico**

Air carriers: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Road and rail: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad and their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

Road (in areas under federal jurisdiction): Secretaría de Comunicaciones y Transportes. Dirección General de Policia Federal de Caminos y Puertos. (Mexico City, D.F.: 1998).

**United States**

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998 and National Transportation Statistics 1999*. (Washington, DC: 1998 and 1999).

# Transportation Injuries by Mode

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Injuries, total</b>	<b>263,196</b>	<b>242,164</b>	<b>231,089</b>	<b>93,417</b>	<b>121,936</b>	<b>115,507</b>	<b>3,292,000</b>	<b>3,516,000</b>	<b>3,559,000</b>
<b>Air</b>	<b>72</b>	<b>66</b>	<b>45</b>	<b>52</b>	<b>52</b>	<b>30</b>	<b>478</b>	<b>459</b>	<b>458</b>
Air carriers	15	27	12	0	0	0	76	64	99
General aviation	57	39	33	52	52	30	402	395	359
<b>Road</b>	<b>262,680</b>	<b>241,935</b>	<b>230,890</b>	<b>93,325</b>	<b>121,638</b>	<b>115,274</b>	<b>3,231,000</b>	<b>3,465,000</b>	<b>3,511,000</b>
Passenger cars and light trucks	216,993	202,275	194,161	38,796	52,052	51,947	2,881,000	3,191,000	3,246,000
Passenger cars	U	U	U	U	U	U	2,376,000	2,469,000	2,478,000
Motorcycles	9,230	6,159	5,202	1,156	5,592	5,405	84,000	57,000	56,000
Buses	1,879	1,393	1,407	4,359	5,565	5,998	33,000	19,000	20,000
Large trucks	3,951	3,377	3,231	638	1,025	1,340	42,000	30,000	33,000
Pedestrians	16,351	14,888	14,420	11,658	15,556	13,019	105,000	86,000	82,000
Other	14,276	13,843	12,469	558	7,988	4,240	86,000	81,000	74,000
<b>Pipeline</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>76</b>	<b>64</b>	<b>127</b>
<b>Rail</b>	<b>375</b>	<b>128</b>	<b>129</b>	<b>40</b>	<b>246</b>	<b>203</b>	<b>25,143</b>	<b>14,440</b>	<b>12,558</b>
Grade crossing	201	76	69	U	U	U	2,407	1,894	1,610
Railroad	174	52	60	U	U	U	22,736	12,546	10,948
<b>Transit, total</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>54,556</b>	<b>57,196</b>	<b>55,288</b>
Transit rail	N	N	N	N	N	N	13,718	14,931	14,650
<b>Water transport</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>3,997</b>	<b>4,286</b>	<b>4,571</b>
Passenger vessels	N	N	N	N	N	N	U	U	U
Recreational boats	N	N	N	N	N	N	3,822	4,141	4,442
Commercial passenger vessels	7	6	4	N	N	N	U	U	U
Commercial freight vessels	53	28	21	N	N	N	U	U	U

<sup>a</sup>Total different from the sum of components because of independent rounding.

KEY: N = Data are nonexistent. U = Data are unavailable.

# Transportation Injuries by Mode—Continued

## NOTES

### All Countries

Injuries, total: For the United States, the number for total injuries is less than the sum of the injuries listed for individual modes because some injuries are counted in more than one mode. That is, the United States has corrected for double counting in calculating total injuries (see Appendix B). For Canada, the total shown is the sum of the modal totals and has not been corrected for double counting. (Note also, that Canadian injury data for transit and recreational boats do not exist. These data, if available, would increase the overall injury totals for Canada.) For Mexico, the total is the sum of air, road and rail only, and therefore the total number of transportation injuries is underrepresented.

Air: United States and Canada include injuries from both passenger and all-cargo flights. Mexico includes injuries from passenger flights only. For Canada and the United States, the air carrier data are for their own national flag carriers, operating both domestic and international flights.

Road: Data refer to occupants of the road motor vehicles listed. Other comprises pedalcyclists, other nonmotorists (except pedestrians, who are separately listed) and occupants of other or unknown motor vehicles.

Road: For Canada and the United States, there is extensive follow-up on road injuries. For Mexico, only serious injuries apparent at the site of the crash are counted.

Water transport: U.S. and Canadian data are not comparable in several respects. See Appendix B, All Countries.

### Mexico

Road: Includes 36,160, 33,860 and 33,325 injuries that occurred on the federal highway network in 1990, 1995 and 1996, respectively. These injuries cannot be allocated to a specific vehicle category but are included in the road total.

### United States

Injuries, total: Total Injuries are rounded to the nearest 1,000.

Road injuries: Data on road injuries are derived from a sample. Injuries in the other modes are a total count.

## SOURCES

### Canada

Air: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Road: Transport Canada. Road Safety and Motor Vehicle Regulation. Traffic Accident Information Database. Special tabulation. (Ottawa, Ont.: 1998).

Pipeline: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Rail: Transportation Safety Board of Canada (TSB). Ministry of Public Works and Government Services. *TSB Statistical Summary: Railway Occurrences 1997*. (Ottawa, Ont.: 1998).  
Water, commercial passenger and freight vessels: Transportation Safety Board of Canada (TSB). Minister of Public Works and Government Services. *TSB Statistical Summary: Marine Occurrences 1997*. (Ottawa, Ont.: 1998).

Water, recreational boats: Canadian Red Cross. Special tabulation. (Ottawa, Ont.: 1998).

### Mexico

Air carriers: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Road and rail: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad or their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

Road (in areas under federal jurisdiction): Secretaría de Comunicaciones y Transportes. Dirección General de Policia Federal de Caminos y Puertos. (Mexico City, D.F.: 1998).

### United States

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998 and National Transportation Statistics 1999*. (Washington, DC: 1998 and 1999).



## Motor Vehicle Fatality and Injury Rates

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
Road motor vehicle fatalities, total	3,963	3,351	3,091	10,201	9,043	9,305	44,599	41,817	42,065
Road motor vehicle injuries, total	262,680	241,935	230,890	93,325	121,638	115,274	3,231,000	3,465,000	3,511,000
Road vehicle-kilometers, total (billions)	N	<sup>e</sup> 317.1	N	N	N	N	3,450	3,899	3,995
Road motor vehicles, total (millions)	17.0	<sup>r</sup> 17.0	<sup>r</sup> 17.2	10.2	12.0	12.4	193.1	205.4	210.2
<b>Rates per 100 million vehicle-km</b>									
Fatality	N	<sup>e</sup> 1.1	N	N	N	N	1.3	1.1	1.1
Injury	N	76	N	N	N	N	94	89	88
<b>Rates per 10,000 road motor vehicles</b>									
Fatality	2.3	2.0	1.8	10.0	7.5	7.5	2.3	2.0	2.0
Injury	155	142	134	91	101	93	167	169	167

KEY: e = Data are estimated. N = Data are nonexistent. r = Data are revised.

## SOURCES

## Canada

Road vehicle-kilometers: Transport Canada. Ministry of Public Works and Government Services. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

Road motor vehicles: Statistics Canada. *Road Motor Vehicles Registrations, Catalogue No. 53-219-XPB*. (Ottawa, Ont.: various years).

Road fatalities and injuries: Transport Canada. Road Safety and Motor Vehicle Regulation. *Traffic Accident Information Database*. Special tabulation. (Ottawa, Ont.: 1998).

## Mexico

Road motor vehicles: Instituto Nacional de Estadística, Geografía e Informática based on figures from Departamento del Distrito Federal, Dirección General de Autotransporte Urbano; state finance office and state police and traffic offices. (Mexico City, D.F.: various years).

Road fatalities and injuries: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad or their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

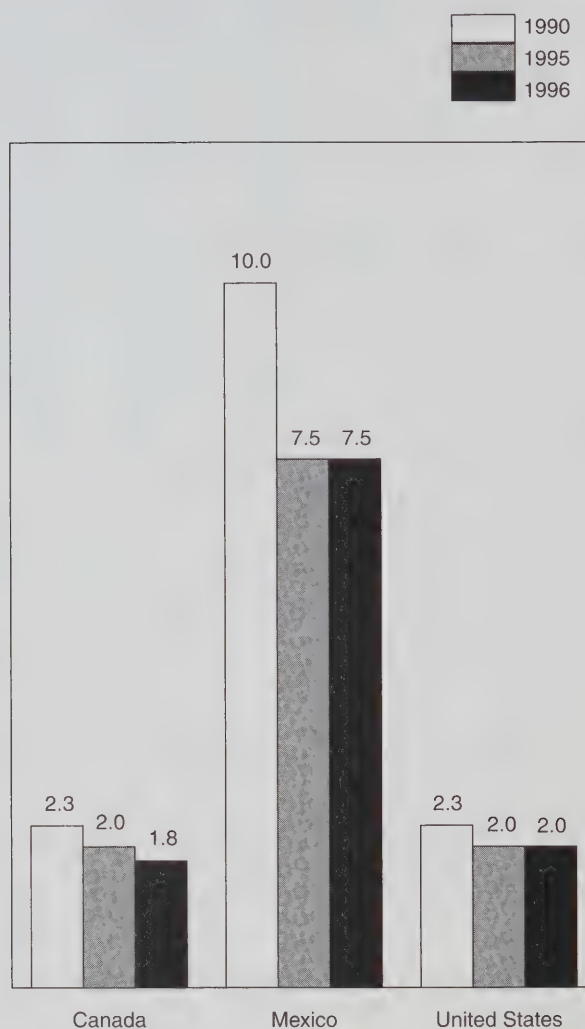
Secretaría de Comunicaciones y Transportes. Dirección General de Policía Federal de Caminos y Puertos. (Mexico City, D.F.: various years).

## United States

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998* and *National Transportation Statistics 1999*. (Washington, DC: 1998 and 1999).

**figure 3-3**

# Road Fatality Rate per 10,000 Vehicles: 1990, 1995 and 1996



Notes and sources: See Table 3-3.

## Air Carrier Fatality and Injury Rates

	Canada		Mexico		United States	
	1990 through 1996 (cumulative)	1990 through 1996 (annual averages)	1993 through 1996 (cumulative)	1993 through 1996 (annual averages)	1990 through 1996 (cumulative)	1990 through 1996 (annual averages)
Air carrier fatal accidents	7	1.0	1	0.25	27	3.9
Air carrier fatalities	282	40	1	0.25	922	132
Air carrier injuries	11	1.6	2	0.50	231	33
Air carrier flight segments (thousands)	10,590	1,513	2,149	537	57,037	8,148
<b>Rates per 100,000 flight segments</b>						
Fatal accident	0.066 (+0.031; -0.021)		0.047		0.047 (+0.010; -0.008)	
Fatality	2.66		0.047		1.62	
Injury	0.10		0.093		0.41	

## NOTES

## All Countries

Data definitions: Data are based on fatalities and injuries occurring for domestic air carriers, scheduled and and nonscheduled operations, passenger and cargo operations, anywhere in the world. For explanations of the differences between this table and air data in Tables 3-1 and 3-2, see the individual country notes in Appendix B.

Cumulative data: Air carrier fatal accidents, fatalities and injuries have been summed over a number of years, as shown in Table 3-4. This is a departure from the other tables in this report, which present data for individual years. This has been done because fatal accidents involving commercial air carriers are *rare*. In particular, the extreme rarity of fatal accidents in which large numbers of people are killed causes large and unpredictable fluctuations in the number of fatalities from year to year. That is, the statistics for a single year reveal little about what to expect the next year; reveal little about whether air safety is getting better or worse compared to past years and reveal little about one country's safety record compared to another's. Only by adding up several years can these large random fluctuations be partly smoothed out. The fatal accident, fatality and injury **rates** are thus averages over the multi-year periods shown in Table 3-4.

Standard deviation in the fatal accident and fatality rates: Canada and the United States: The Canadian and U.S. fatal accident rates are within about one standard deviation of each other. As discussed in Appendix B, the Canadian and U.S. fatality rates differ by less than one standard deviation. **No statistically valid comparison can be made between rates if the standard deviation on the rates is not known. For more information on the standard deviations of the rates in this table, including estimates of standard deviations not presented in this table, see the discussion in Appendix B under All Countries.**

## Canada

Coverage: Data for air carrier fatal accidents, fatalities and injuries refer to all Canadian-registered airplanes used by Level I and Level II Canadian air operators that have a maximum take-off weight (MCTOW) of more than 8,618 kg (19,000 pounds) or for which a Canadian type certificate has been issued authorizing the transport of 20 or more passengers.

Flight operations: Data for air carrier flight operations refers to passenger and cargo flights of Canadian registered airplanes used by Level I and Level II and is obtained from two air carrier surveys conducted by Statistics Canada, namely: Major Scheduled Air Services Survey; and, Major Charter Air Services Survey. The data concerning cargo flight operations relate to only major scheduled and charter services, as regional and local scheduled carriers are not required to file cargo data. The Major Scheduled Air Survey conducted by Statistics Canada does not include air carriers which utilize aircraft under 13,607 kg (30,000 pounds). Similarly, the Major Charter Air Survey conducted by Statistics Canada does not include air carriers which utilize aircraft under 15,900 kg (35,000 pounds) domestically and internationally, and under 8,200 kg (18,080 pounds) on transborder journeys.

## Air Carrier Fatality and Injury Rates—Continued

### United States

Coverage: Data include **only** aircraft operating under the U.S. Code of Federal Regulations 121 (14 CFR 121); i.e., commercial aircraft that are operated by U.S. flag airlines and that have more than 30 seats or a maximum payload capacity of more than 7,500 pounds (3,402 kg).

Fatalities: Includes the 12 people killed in 1991 aboard a commuter aircraft when it and a CFR 121 airliner collided.

### SOURCES

#### Canada

Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998). Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998).

#### Mexico

Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998). Aeropuertos y Servicios Auxiliares. (Mexico City, D.F.: 1998).

### United States

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998* and *National Transportation Statistics 1999*. (Washington, DC: 1998 and 1999).



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section 4

Transportation,  
Energy and the  
Environment



table 4-1

# Energy Consumption by the Transportation Sector

(Exajoules, 10 to the 18 joules)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
Energy consumption, total <sup>a</sup>	7.84	8.59	8.98	5.16	5.49	5.90	88.75	95.86	99.04
Transportation consumption, total <sup>b</sup>	2.04	2.27	2.33	1.28	1.40	1.44	23.78	25.40	26.02
Transportation's share of total energy consumption (percent)	26.0	26.4	25.9	24.8	25.5	24.4	26.8	26.5	26.3
Fossil fuels, total exajoules <sup>c</sup>	2.03	2.26	2.31	N	N	N	23.73	25.35	25.98
Natural gas (exajoules)	0.14	0.24	0.25	N	N	N	0.72	0.76	0.77
Trillion cubic meters	0.0035	0.0063	0.0065	N	N	N	0.0187	0.0198	0.0201
Petroleum (exajoules)	1.89	2.01	2.06	1.27	1.40	1.43	23.01	24.59	25.20
Million barrels	329	351	359	211	243	249	4,004	4,281	4,385
Electricity <sup>b</sup>	0.012	0.014	0.014	0.003	0.003	0.004	0.015	0.014	0.014

<sup>a</sup>For all three countries, energy consumption, total **includes** electrical system energy losses.

<sup>b</sup>For all three countries, transportation consumption, total and electricity do **not** include electrical system energy losses.

<sup>c</sup>Coal is not included in this table, because all three countries use negligible amounts of coal for transportation.

**KEY:** N = Data are nonexistent.

## NOTES

### Canada

Energy consumption, total: Includes renewable energy.

Transportation consumption, total: Includes fuel used in fisheries and in private trucking but excludes fuel consumption by public administrations.

### Mexico

Natural gas: Data are nonexistent, but natural gas consumption in Mexico is estimated to be quite small.

### United States

Energy consumption, total: Includes renewable energy.

Transportation consumption, total: Total is greater than the sum of the components, because electrical system energy losses are not listed. Fisheries are not included, but fuel consumption by public administrations is included.

## SOURCES

### Canada

Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue No. 57-003-XPB*. (Ottawa, Ont.: various editions).

### Mexico

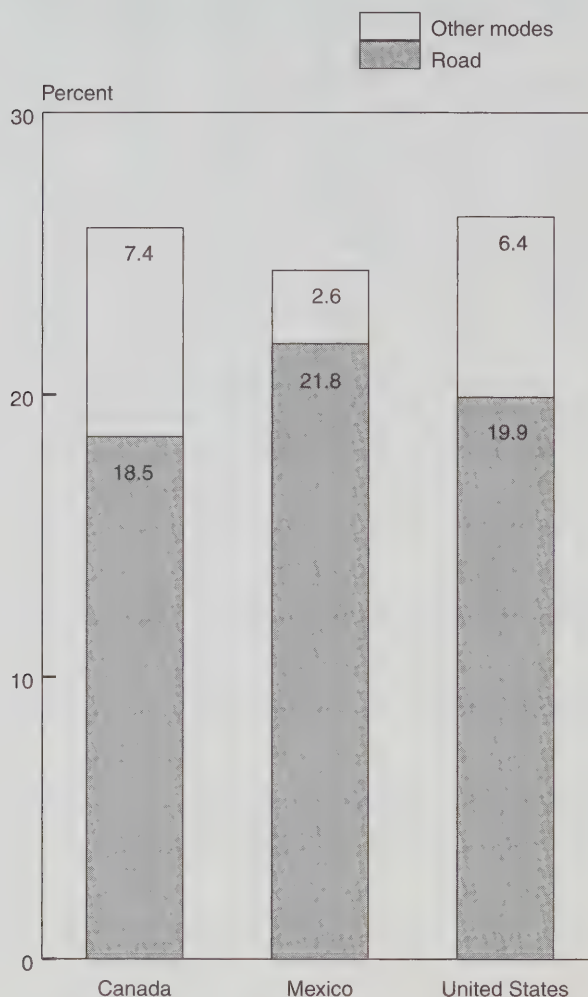
Secretaría de Energía. *Balance Nacional, Energía*. 1996. (Mexico City, D.F.: 1998).

### United States

U.S. Department of Energy. Energy Information Agency. *Annual Energy Review, 1997* and *Monthly Energy Review, August 1998*. (Washington, DC: 1998).

**f i g u r e 4-1**

## Transportation's Percent Share of Total Energy Consumption: 1996



Total energy consumption, Mexico: Pipeline energy consumption is not included in Mexico's transportation energy consumption figures. If pipeline data were included, the share of other modes would be greater and transportation's share of total energy consumption would also be more.

Notes and sources: See Tables 4-1 and 4-2.



# Energy Consumption by Mode of Transportation

(Petajoules, 10 to the 15th joules)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total</b>	<b>2,037.7</b>	<b>2,269.1</b>	<b>2,325.1</b>	<b>1,275.3</b>	<b>1,399.1</b>	<b>1,435.2</b>	<b>23,780</b>	<b>25,400</b>	<b>26,020</b>
<b>Air</b>	<b>185.2</b>	<b>185.1</b>	<b>205.8</b>	<b>73.6</b>	<b>95.4</b>	<b>93.4</b>	<b>1,910</b>	<b>1,937</b>	<b>1,995</b>
Jet fuel	179.7	181.0	201.9	71.9	91.5	92.2	1,865	1,902	1,959
Aviation gasoline	5.5	4.1	3.9	1.7	3.9	1.2	45	35	36
<b>Road</b>	<b>1,494.4</b>	<b>1,631.3</b>	<b>1,661.0</b>	<b>1,147.0</b>	<b>1,253.5</b>	<b>1,289.1</b>	<b>N</b>	<b>19,278</b>	<b>19,752</b>
Gasoline	1,176.0	1,213.7	1,229.4	837.9	928.9	944.4	14,445	15,438	15,762
Diesel	292.5	384.5	397.5	293.9	306.0	325.5	3,100	3,800	3,950
Other fuels	25.9	33.1	34.1	15.2	18.6	19.2	N	40	40
<b>Pipeline</b>	<b>142.4</b>	<b>245.3</b>	<b>254.5</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>718</b>	<b>762</b>	<b>774</b>
Natural gas	133.1	232.9	241.5	U	U	U	718	762	774
Electricity	8.7	11.0	10.8	U	U	U	U	U	U
Diesel	0.6	1.4	2.2	U	U	U	U	U	U
<b>Rail</b>	<b>89.5</b>	<b>80.9</b>	<b>79.1</b>	<b>26.6</b>	<b>22.6</b>	<b>24.7</b>	<b>469</b>	<b>520</b>	<b>536</b>
Distillate/diesel fuel	89.5	80.9	79.1	26.6	22.6	24.7	468	519	535
Freight rail	87.2	78.8	77.0	U	U	U	456	509	524
Intercity passenger	2.3	2.1	2.1	U	U	U	12	10	11
Electricity				U	U	U			
Intercity passenger	NS	NS	NS	U	U	U	1	1	1
<b>Transit</b>	<b>19.0</b>	<b>24.6</b>	<b>23.5</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>125</b>	<b>123</b>
Electricity	3.1	3.0	3.0	2.7	3.5	3.6	17	18	18
Motor fuels									
Gasoline	0.5	0.4	NS	N	N	N	4	6	6
Diesel	12.8	13.4	12.7	N	N	N	95	99	97
Compressed natural gas	2.6	7.8	7.8	N	N	N	N	2	2
<b>Water transport</b>	<b>107.3</b>	<b>102.0</b>	<b>101.3</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>1,472</b>	<b>1,412</b>	<b>1,396</b>
Residual fuel oil	60.1	55.7	55.3	20.7	1.4	1.6	999	930	900
Distillate/diesel fuel oil	47.2	45.5	45.4	4.7	22.7	22.9	302	342	365
Gasoline	NS	0.8	0.6	N	N	N	171	140	131

**KEY:** N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

## NOTES

### All Countries

Transportation energy consumption: Electrical systems energy losses are excluded from the overall total as well as individual modal totals.

Transit: Canadian and U.S. data refer to **all transit**, including local transit buses and other road transit vehicles, which are also reported under road. Some ferryboats are also included.

### Mexico

Road, other fuels: Refers to liquified petroleum gas.

Road, gasoline, diesel, other fuels: Includes data on transit, motor fuels, and no breakdown is possible.

Rail, distillate/diesel fuel: Includes passenger and cargo services, and no breakdown is possible.

Transit, motor fuels: Data for subcategories cannot be separately identified for transit. Instead they are included in the fuel categories for road (gasoline, diesel and other fuels).

Water transport, residual fuel oil, distillate/diesel fuel oil: In 1991, vessel fuel usage began to change. Diesel began to be substituted for residual fuel oil.

### United States

Total: The total differs from the sum of the individual modes for reasons discussed in Appendix B.

# Energy Consumption by Mode of Transportation—Continued

## SOURCES

### Canada

All modes except transit rail: Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada*, Catalogue No. 57-003-XPB. (Ottawa, Ont.: various quarterly editions).

Natural Resources Canada. *Canada's Energy Outlook 1996-2020*. (Ottawa, Ont.: 1998).

Transit rail: Statistics Canada. *Passenger Bus and Urban Transit Statistics*, Catalogue No. 53-215-XPB. (Ottawa, Ont.: various years).

### Mexico

Secretaría de Energía. *Balance Nacional, Energía*. 1996. (Mexico City, D.F.: 1998).

Comisión Nacional para el Ahorro de Energía. Private communication. (Mexico City, D.F.: 1998).

### United States

Total: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review*, 1997. (Washington, DC: 1998).

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Avionics Survey*. (Washington, DC: various years).

Road: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics*, 1996. (Washington, DC: 1997).

U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels*, 1996. (Washington, DC: 1997).

Pipeline: U.S. Department of Energy. *Natural Gas Annual 1996*. (Washington, DC: 1997).

Rail: Association of American Railroads. *Railroad Facts*, 1997 Edition. (Washington, DC: 1997).

National Railroad Passenger Corp. State and Local Affairs Department. Private Communication. (Washington, DC: 1998).

National Railroad Passenger Corp. Director of Fuel Management. Private Communication. (Washington, DC: 1998).

American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

American Public Transit Association. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Energy. Energy Information Administration. *Fuel Oil and Kerosene Sales*. (Washington, DC: various years).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics*, 1996. (Washington, DC: 1997).

table 4-3

# Estimated Consumption of Alternative and Replacement Fuels for Road Motor Vehicles

(Thousand gasoline-equivalent liters)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1992 <sup>a</sup>	1995	1996
<b>Fuel consumption, total</b>	<b>42,324,176</b>	<b>46,177,399</b>	<b>46,997,886</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>508,118,000</b>	<b>548,035,000</b>	<b>560,929,000</b>
<b>Alternative fuels, total</b>	<b>824,370</b>	<b>1,179,468</b>	<b>1,210,743</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>869,248</b>	<b>1,050,478</b>	<b>1,125,142</b>
Liquefied petroleum gases (LPG)	748,240	954,847	985,256	N	N	N	787,903	880,869	905,312
Compressed natural gas (CNG)	76,110	224,321	225,187	N	N	N	63,682	133,103	177,623
Liquefied natural gas (LNG)	0	0	0	N	N	N	2,214	10,444	12,291
Methanol, 85 percent (M85)	20	300	300	N	N	N	4,047	10,928	12,833
Methanol, neat (M100)	0	0	0	N	N	N	9,641	8,139	1,314
Ethanol, 85 percent (E85)	0	0	0	N	N	N	79	719	2,627
Ethanol, 95 percent (E95)	0	0	0	N	N	N	322	3,766	10,217
<b>Electricity</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>1,359</b>	<b>2,510</b>	<b>2,926</b>
Oxygenates									
Methyl tertiary butyl ether (MTBE)	NS	NS	NS	N	N	N	4,448,000	10,187,300	10,408,700
Ethanol in gasohol	10,000	40,000	40,000	N	N	N	2,654,000	3,447,400	2,499,100
<b>Traditional fuels</b>									
Gasoline	33,928,534	35,017,600	35,471,523	N	N	N	416,906,000	438,892,000	445,857,000
Diesel	7,561,272	9,940,331	10,275,620	N	N	N	90,343,000	108,092,590	113,946,310

<sup>a</sup>U.S. data for 1990 are not available. Nearest data year is 1992.

**KEY:** N = Data are nonexistent. NS = Not significant.

## NOTE

### Mexico

Alternative fuels, liquefied petroleum gases: In Table 4-2 under road, other fuels, an estimation of fuel consumption in petajoules is shown.

## SOURCES

### Canada

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

### United States

U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997).

# Average Price<sup>a</sup> of Fossil Fuel to End-Users

(Current U.S. cents per liter)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Motor vehicle fuel</b>									
<b>Gasoline</b>									
Leaded	NA	NA	NA	25.2	33.6	36.8	30.4	NA	NA
Unleaded premium	54.0	47.2	49.4	NA	NA	41.8	35.6	35.3	37.3
Unleaded regular	50.1	40.4	42.5	35.6	34.9	37.9	30.7	30.3	32.5
Average over all types									
Price with taxes	U	U	U	U	U	U	32.1	31.8	34.0
Taxes	19.6	19.5	19.9	U	U	U	6.5	9.7	9.8
<b>Diesel</b>									
Price with taxes	43.1	30.7	31.7	21.5	25.5	28.2	U	29.3	32.6
Taxes	15.3	12.2	12.3	U	U	U	8.2	11.5	11.4
<b>Aviation fuel</b>									
Gasoline	42.1	31.3	31.6	35.6	34.9	37.9	29.6	26.5	29.5
Jet fuel	22.1	14.1	15.4	25.2	17.8	23.4	20.3	14.4	17.1
<b>Rail fuel</b>									
Diesel	23.5	15.7	17.1	21.5	25.5	28.2	18.3	15.9	17.9
<b>Water transport</b>									
Combined fuels	14.4	10.1	11.6	8.1	6.5	13.2	U	10.1	11.0

<sup>a</sup>Unless otherwise stated in the country notes below, prices include the cost of the fuel and taxes. Taxes are given separately in this table only for all types of motor vehicle gasoline and for motor vehicle diesel fuel. See Appendix B for information on fuel taxes in each country.

**KEY:** NA = Not applicable. U = Data are unavailable.

## NOTES

### Mexico

Data refer to sales price to the public as of December 31 of each year.

### United States

Motor vehicle fuel taxes: Sales weighted average of Federal and state fuel taxes only. Does not include state sales taxes. If these were included, they would raise the average tax in 1996 by roughly half a cent per liter for both gasoline and diesel. Note that the motor vehicle fuel prices do include state sales taxes.

Aviation fuel: Does not include any taxes. Price of jet fuel is that paid by the large certified air carriers, which are defined in Appendix B.

Rail fuel: Price includes federal fuel taxes only, no state taxes are included.



Average Price<sup>a</sup> of Fossil Fuel to End-Users—Continued

## SOURCES

## Canada

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

## Mexico

Petróleos Mexicanos. *Anuario Estadístico, 1998*. (Mexico City, D.F.: 1999).

Petróleos Mexicanos. PEMEX-Refinación. Subgerencia de Planeación (Mexico City, D.F.: 1999)

## United States

Motor vehicle fuel: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

Aviation fuel, gasoline: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998).

Aviation fuel, jet fuel: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication. (Washington, DC: 1998).

Rail fuel: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997).

Rail fuel taxes: Association of American Railroads. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration (MARAD). Private Communication. (Washington, DC: 1998).

# New Model Year Fuel Efficiency for Road Motor Vehicles

(Liters per 100 kilometers)

	Canada		Mexico		United States	
	1990	1995	1990	1995	1990	1995
<b>Sales weighted average</b>						
Passenger cars	8.2	7.9	9.1	8.0	8.4	8.2
Light trucks	11.4	11.5	U	U	11.3	11.5
<b>Range</b>						
Passenger cars	20.8 to 5.0	19.4 to 4.9	U	9.28 to 6.9	27.0 to 3.6	22.8 to 4.0
Light trucks	22.4 to 6.8	18.8 to 8.5	U	U	19.8 to 7.0	16.0 to 7.0

KEY: U = Data are unavailable.

## NOTES

### All Countries

Sales weighted average: Assumes 55 percent city and 45 percent highway travel.

Light trucks: Gross vehicle weight rating of zero kg to 3,856 kg (i.e., 8,500 pounds or less).

Averages and ranges: United States and Canada include both domestic and imported vehicles. Mexico includes only domestic vehicles.

## SOURCES

### Canada

Sales weighted average: Transport Canada. *Transportation in Canada, 1997—Annual Report, TP 13198*. (Ottawa, Ont.: 1998).

Ranges: Natural resources Canada. *Canada's Energy Outlook, 1996-2020*. (Ottawa, Ont.: 1997).

Transport Canada and Natural Resources Canada. *Fuel Consumption Guide, Annual*. (Ottawa, Ont.: various years).

### Mexico

Secretaría de Energía. Comisión Nacional para el Ahorro de Energía, Dirección de Transporte. (Mexico City, D.F.: 1998).

### United States

Sales weighted average: U.S. Department of Transportation. National Highway Traffic Safety Administration. Consumer Programs Division, NPS-32. (Washington, DC: 1998).

Ranges: U.S. Department of Transportation. National Highway Traffic Safety Administration. Automotive Fuel Economy Program. *Twenty-Second Annual Report to Congress*. (Washington, DC: various years).

U.S. Department of Transportation. National Highway Traffic Safety Administration. Consumer Programs Division, NPS-32. Private Communication. (Washington, DC: 1998).

**table 4-6a**

# Federal Emission Control Requirements for Passenger Cars and Light Trucks: Model Year

(Grams of emissions per kilometer)

	Total hydrocarbons	Nonmethane hydrocarbons	Carbon monoxide (CO)	Cold temperature CO	Nitrogen oxides	Particulates
<b>Canada, 1996</b>						
Passenger cars	0.25	NA	2.1	NA	0.62	<sup>a</sup> 0.12
Light trucks						
Under 1,701 kg, (loaded vehicle weight)	0.50	NA	6.2	NA	0.75	<sup>a</sup> 0.16
Over 1,700 kg, (loaded vehicle weight)	0.50	NA	6.2	NA	1.1	<sup>a</sup> 0.08
<b>Mexico, model years 1995 and later</b>						
Passenger cars	0.25	NA	2.11	NA	0.62	NA
Light trucks	0.63	NA	8.75	NA	1.44	NA
Under 3,857 kg, (gross vehicle weight)						
<b>United States, model years 1994 and later</b>						
Passenger cars						
Intermediate useful life	0.25	0.16	2.1	6.2	0.25	0.05
Full useful life	NA	0.19	2.6	NA	0.4	0.06
Light trucks						
1,701 to 2,608 kg, (loaded vehicle weight)						
Intermediate useful life	NA	0.20	2.7	6.2	0.4	<sup>b</sup> 0.05
Full useful life	0.50	0.25	3.4	NA	0.60	<sup>b</sup> 0.06

<sup>a</sup>Applies to diesel-fueled vehicles only.

<sup>b</sup>Phase-in begins with model-year 1995.

**KEY:** NA = Not applicable.

## NOTES

### All Countries

Light trucks are vehicles of about 3,856 kg or less gross vehicle weight rating (GVWR). For United States and Canada, the **exact** definition is 8,500 pounds or less, and, for the time period of this table, there are four and two categories of light trucks, respectively, within the range of zero through 8,500 pounds.

### Canada

Loaded vehicle weight (LVW): See Appendix B under the United States for definition.

From September 1, 1997, Canadian standards are harmonized with U.S. standards by regulation, for all classes of on-road vehicles.

Passenger cars and light trucks: For cars (light-duty vehicles) and light trucks (light-duty trucks, LDT), Canadian 1996 regulated standards were technically equivalent to those of the United States for 1988 model year vehicles, but in practice, manufacturers and importers provided vehicles meeting U.S. 1996 standards.

### Mexico

Particulates: No regulations are in effect for particulates for these vehicles.

### United States

Useful life: The life over which the standards must be met. See Appendix B for a more complete definition.

Measurement units: The U.S. regulations are written in units of grams per mile. This table has converted the U.S. regulations to grams per kilometer. A simple conversion back to U.S. measures will result in rounding error and/or an incorrect level of precision in some cases. Appendix D provides the original U.S. measures.

Coverage: This table is a **simplification** of the U.S. emissions standards for passenger cars and light trucks.

Implementation schedules: Schedules are summarized in Appendix B. The standards were phased in over several years.

Passenger cars and light trucks: Data are for **gasoline-fueled vehicles only**. See Appendix B for the differences for diesel fueled vehicles.

Light trucks: There are four categories of light trucks. The regulations presented here are for the LDT2 category, which has a GVWR up to 2,722 kg (ie., 6,000 pounds or less) and a LVW of 1701 kg to 2,608 kg (i.e., 3,751 pounds through 5,750 pounds). (GVWR and LVR are defined in Appendix B.) In 1996, LDT2s accounted for more than 60 percent of the sales of new light trucks.

## table 4-6a

### Federal Emission Control Requirements for Passenger Cars and Light Trucks: Model Year—*Continued*

#### SOURCES

##### Canada

Transport Canada. Road Safety and Motor Vehicle Regulations Directorate. (Ottawa, Ont.: 1998).

##### Mexico

Instituto Nacional de Ecología. Diario Oficial de la Federación. *Norma Oficial Mexicana NOM-042-ECOL-1993*. (Mexico City, D.F.: 1993).

##### United States

*U.S. Code of Federal Regulations*. (Washington, DC: 1998).

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary*. (Washington, DC: 1992).

U.S. Environmental Protection Agency. Office of Air and Radiation. Office of Mobile Sources, Vehicle Programs and Compliance Division. *Tier 2 Study White Paper*. (Washington, DC: 1997).



# Federal Emission Control Requirements for Heavy Trucks: Model Year

(Grams of emissions per brake horsepower-hour)

	Total hydrocarbons	Carbon monoxide (CO)	Nitrogen oxides	Particulates	Smoke (percentage)
<b>Mexico</b>					
Compression ignition, model years 1994-1997 (weight more than 3,857 kg)	1.3	15.5	5.0	0.7 or 0.10	20/15/50
Spark ignition, model years 1995-1997					
Weight between 3,858 and 6,350 kg	1.1	14.4	5.0	NA	NA
Weight greater than 6,350 kg	1.9	37.1	5.0	NA	NA
<b>United States and Canada, model years 1994 and later</b>					
Compression ignition, model years 1994-1997 (weight more than 3,856 kg; i.e., more than 8,500 pounds)	1.3	15.5	5.0	0.10	20/15/50
Spark ignition, model years 1991-1997					
Weight between 3,856 and 6,350 kg	1.1	14.4	5.0	NA	NA
Weight greater than 6,350 kg	1.9	37.1	5.0	NA	NA

KEY: NA = Not applicable.

## NOTES

### All Countries

Compression ignition, smoke: Percentages apply to smoke opacity at acceleration/lug/peak modes.

### Canada

From September 1, 1997, Canadian standards are harmonized with U.S. standards by regulation, for all classes of on-road vehicles.

Heavy trucks: For heavy trucks (heavy-duty vehicles), Canadian vehicles were provided to U.S. standards by a Memorandum of Understanding with the industry.

### Mexico

Compression ignition, particulates: The limit is 0.10 for vehicles under 14,969 kg and 0.7 for vehicles over 14,969 kg.

### United States

Compression ignition: Standards apply to both diesel and methanol-fueled engines.

Spark ignition: Standards apply to gasoline, methanol and liquified petroleum gas-fueled engines (LPG).

Spark ignition, weights: The first category of spark ignition heavy trucks in this table weighs more than 8,500 pounds and weighs 14,000 pounds or less. The second category weighs more than 14,000 pounds.

## SOURCES

### Canada

Transport Canada. Road Safety and Motor Vehicle Regulations Directorate. (Ottawa, Ont.: 1998).

### Mexico

Instituto Nacional de Ecología. *Diario Oficial de la Federación. Norma Oficial Mexicana NOM-044-ECOL-1993.* (Mexico City, D.F.: 1993).

Secretaría de Medio Ambiente, Recursos Naturales y Pesca. *Diario Oficial de la Federación. Norma Oficial Mexicana NOM-076-ECOL-1995.* (Mexico City, D.F.: 1995).

### United States

U.S. Environmental Protection Agency. Office of Air and Radiation. *Emission Standards Reference Guide for Heavy-Duty and Nonroad Engines (EPA420-F-97-014).* (Washington, DC: 1997).

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary.* (Washington, DC: 1992).



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s e c t i o n

5

# Domestic Freight Activity





## Domestic Freight Activity by Mode

(Millions of metric tons)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total</b>	<b>623.3</b>	<b>711.8</b>	<b>734.6</b>	<b>380.1</b>	<b>429.3</b>	<b>445.2</b>	<b>6,079.3</b>	<b>7,062.0</b>	<b>7,320.7</b>
<b>Air</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>7.7</b>	<b>8.5</b>	<b>9.8</b>
<b>Water transport</b>	<b>60.4</b>	<b>50.5</b>	<b>48.8</b>	<b>30.6</b>	<b>31.8</b>	<b>31.6</b>	<b>1,014.0</b>	<b>985.4</b>	<b>991.9</b>
Coastal shipping	26.2	22.6	21.1	30.6	31.8	31.6	270.9	241.9	242.6
Great Lakes	10.6	7.7	8.8	NA	NA	NA	99.9	105.3	104.2
Inland waterways <sup>a</sup>	23.6	20.2	18.9	NA	NA	NA	643.2	638.1	645.1
<b>Pipeline</b>	<b>221.4</b>	<b>290.6</b>	<b>303.5</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>1,416.2</b>	<b>1,551.6</b>	<b>1,611.8</b>
Crude oil and petroleum products	145.8	174.5	183.4	U	U	U	958.9	1,017.0	1,067.8
Natural gas	75.6	116.1	120.1	U	U	U	457.3	534.6	544.0
<b>Rail</b>	<b>191.8</b>	<b>203.0</b>	<b>200.0</b>	<b>34.7</b>	<b>30.7</b>	<b>30.2</b>	<b>1,292.6</b>	<b>1,405.8</b>	<b>1,461.4</b>
<b>Road</b>	<b>149.3</b>	<b>167.3</b>	<b>181.9</b>	<b>314.7</b>	<b>366.7</b>	<b>383.3</b>	<b>2,348.7</b>	<b>3,110.7</b>	<b>3,245.9</b>

<sup>a</sup>Commercially navigable.

KEY: NA = Not applicable. U = Data are unavailable.

## NOTES

## Canada

Road: Includes *only* activity of Canadian domiciled for-hire carriers with annual intercity revenues greater than or equal to 1 million Canadian dollars; excludes local (less than 24 kilometers) deliveries and deliveries made by private trucks and small for-hire carriers.

Pipeline: Data are for both oil pipelines and natural gas.

## Mexico

Total: Does not include data for pipelines because the data are unavailable.

Road: Includes only intercity truck activity on the Mexican federal highway system.

## United States

Road: Data are for *intercity* for-hire and private truck only.

Pipeline: Data are for both oil pipelines and natural gas.

## SOURCES

## Canada

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterways and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate, based on Statistics Canada data. (Ottawa, Ont.: 1998).

Road: Statistics Canada. *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).

## Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1998).Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1998).

## Domestic Freight Activity by Mode—Continued

## United States

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years).

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues).

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years).

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997).

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997).

table 5-2

# Domestic Freight Activity by Mode

(Billions (thousand millions) of metric ton-kilometers)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total</b>	<b>520.7</b>	<b>602.8</b>	<b>614.3</b>	<b>154.1</b>	<b>206.0</b>	<b>212.7</b>	<b>5,070.0</b>	<b>5,784.7</b>	<b>5,916.2</b>
<b>Air</b>	<b>0.5</b>	<b>0.6</b>	<b>0.6</b>	<b>0.9</b>	<b>1.2</b>	<b>1.0</b>	<b>10.9</b>	<b>15.6</b>	<b>16.0</b>
<b>Water transport</b>	<b>53.7</b>	<b>42.5</b>	<b>40.2</b>	<b>19.3</b>	<b>20.0</b>	<b>19.9</b>	<b>1,217.0</b>	<b>1,179.3</b>	<b>1,116.4</b>
Coastal shipping	14.0	10.5	10.3	19.3	20.0	19.9	699.5	642.9	595.8
Great Lakes	7.3	5.1	5.4	NA	NA	NA	89.0	87.2	85.2
Inland waterways <sup>a</sup>	32.4	26.9	24.5	NA	NA	NA	428.5	449.2	435.5
<b>Pipeline</b>	<b>212.2</b>	<b>273.9</b>	<b>280.6</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>1,259.5</b>	<b>1,338.9</b>	<b>1,364.6</b>
Crude oil and petroleum products	102.8	103.9	105.0	U	U	U	852.8	877.6	904.0
Natural gas	109.4	170.0	175.6	U	U	U	406.7	461.3	460.6
<b>Rail</b>	<b>199.6</b>	<b>220.0</b>	<b>221.4</b>	<b>25.0</b>	<b>22.0</b>	<b>21.0</b>	<b>1,509.6</b>	<b>1,906.3</b>	<b>1,979.7</b>
<b>Road</b>	<b>54.7</b>	<b>65.8</b>	<b>71.5</b>	<b>108.9</b>	<b>162.8</b>	<b>170.8</b>	<b>1,073.1</b>	<b>1,344.6</b>	<b>1,439.5</b>

<sup>a</sup>Commercially navigable.

**KEY:** NA = Not applicable. U = Data are unavailable.

## NOTES

### Canada

Road: Data include only activity of Canadian domiciled for-hire carriers with annual intercity revenues greater than or equal to 1 million Canadian dollars. Data excludes local (less than 24 kilometers) deliveries, and deliveries made by private trucks and small for-hire carriers.

Pipeline: Data are for both oil pipelines and natural gas.

### Mexico

Total: Does not include data for pipelines because the data are unavailable.

Road: Includes only intercity truck activity on the Mexican federal highway system.

### United States

Pipeline: Data are for both oil pipelines and natural gas.

Road: Data are for *intercity* for-hire and private truck only.

## SOURCES

### Canada

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterways and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate, based on Statistics Canada data. (Ottawa, Ont.: 1998).

Road: Statistics Canada. *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).

### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1998).

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**t a b l e 5-2****Domestic Freight Activity by Mode—Continued****United States**

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years).

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues).

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years).

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

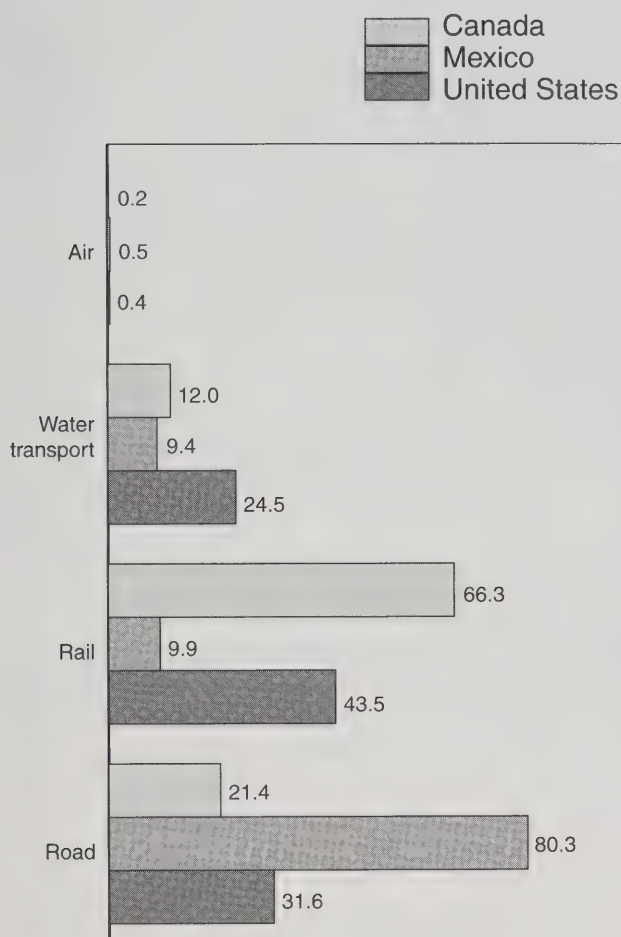
Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997).

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997).



**figure 5-2a**

# Percent Modal Share, Excluding Pipelines, of Total Metric Ton-Kilometers: 1996



Because pipeline data for Mexico are unavailable, pipeline has been excluded from each country's total for overall ton-kilometers and the derived modal shares in this figure. Figure 5-2b shows the modal shares for Canada and the United States when pipelines (both oil and gas) are included.  
Notes and sources: See Table 5-2.

**figure 5-2b**

# Percent Modal Share, Including Pipelines, of Total Metric Ton-Kilometers: 1996

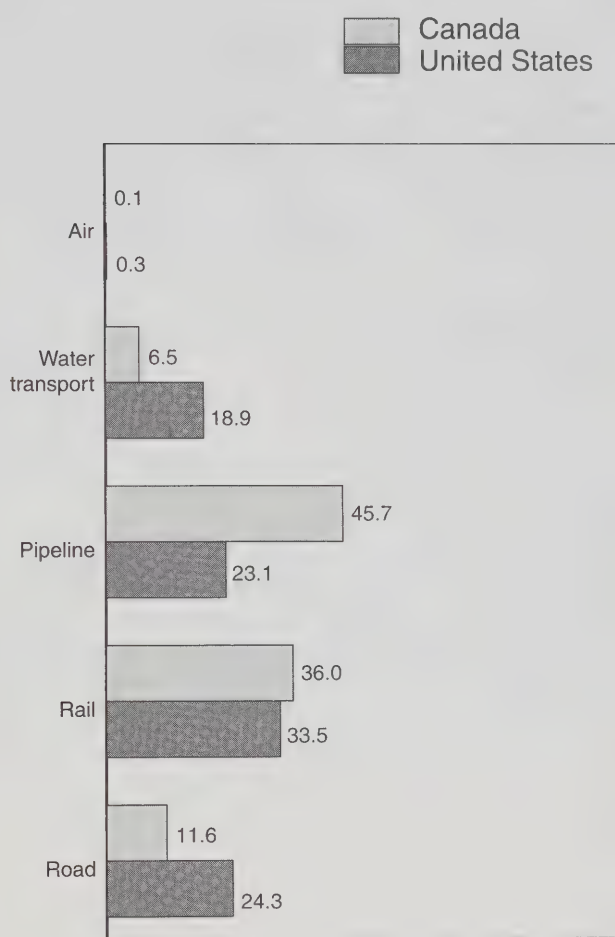


Figure 5-2b shows the modal shares for Canada and the United States when pipelines (both oil and gas) are included. Figure 5-2b more accurately portrays modal shares for Canada and the United States than figure 5-2a, which excludes pipeline data.  
Notes and sources: See Table 5-2.

**table 5-3a**

# Top Canadian Domestic Freight Commodities by Mode: 1996

(Millions of metric tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	
N	N	Forest products	40.3
		Live animals and food products	24.0
<b>Pipeline</b>		Petroleum products	23.1
Natural gas	120.1	Construction materials	18.4
Crude oil	118.9	Steel	14.4
Petroleum products	64.5	<b>Water transport</b>	
		Iron ore	7.0
<b>Rail</b>		Pulpwood and chips	6.7
Bituminous coal	39.8	Wheat	4.8
Iron ore and concentrates	37.4	Stone and limestone	4.7
Wheat	20.3	Fuel oil	4.3
Muriate of potassium (potash)	12.3	<b>Intermodal</b>	
Pulpwood and chips	11.7	N	N

**KEY:** N = Data are nonexistent.

## SOURCES

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB, 1996.* (Ottawa, Ont.: 1997). Statistics Canada. *Gas Utilities, Transport and Distribution Systems, Catalogue No. 57-205-XPB, 1996.* (Ottawa, Ont.: 1997).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB, 1996.* (Ottawa, Ont.: 1998).

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

table 5-3b

# Top Mexican Domestic Freight Commodities by Mode: 1996

(Millions of metric tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	
N	N	Miscellaneous manufactured articles	51.2
		Salt, sulfur, plaster and cement	36.0
		Mineral fuels, oils and waxes	28.9
<b>Pipeline</b>		Edible fruits and vegetables	19.9
Crude oil	U	Beverages, spirits and vinegar	18.6
Natural gas	U	<b>Water transport</b>	
Petroleum products	U	Crude oil and petroleum products	19.4
		Limestone	7.3
<b>Rail</b>		Salt	6.3
Cement	9.3	Iron ore pellets	1.4
Corn	5.9	Cement	0.1
Iron ore	3.9	<b>Intermodal</b>	
Coal	2.8	N	N
Fuel oil	2.4		

**KEY:** U = Data are unavailable. N = Data are nonexistent.

## NOTES

Road and water transport: Data are for 1993.

Road and rail: Data include foreign trade merchandise.

## SOURCES

Rail: Secretaría de Comunicaciones y Transportes. Based on data from the Ferrocarriles Nacionales de México. *Series Estadísticas, 1996*. (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte based on the vehicle's weight and dimensions study. (Sanfandila, Qro.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

table 5-3c

# Top U.S. Domestic Freight Commodities by Mode: 1993

(Millions of metric tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	
Machinery, excluding electricals	0.46	Nonmetallic minerals	1,364.6
Chemicals or allied products	0.32	Petroleum or coal products	900.6
Electrical machinery, equipment or supplies	0.25	Food or kindred products	674.2
Transportation equipment	0.24	Lumber or wood products, excluding furniture	529.0
Instruments, photographic and optical goods, watches or clocks	0.09	Chemicals or allied products	281.7
<b>Pipeline</b>		<b>Water transport</b>	
Crude oil	925.0	Petroleum and petroleum products	844.2
Petroleum products	771.9	Crude materials	327.1
Natural gas	502.6	Coal	272.5
		Food and farm products	244.3
		Chemicals and related products	119.4
<b>Rail</b>		<b>Intermodal (road and rail combination)</b>	
Coal	572.5	Transportation equipment	6.9
Farm products	158.7	Chemicals or allied products	1.9
Nonmetallic minerals	131.5	Food or kindred products	1.7
Petroleum or coal products	123.6	Lumber or wood products, excluding furniture	1.5
Chemicals or allied products	118.2	Pulp, paper or allied products	1.4

## SOURCES

Air, road and rail: U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).

Pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation. (Washington, DC: 1998).

Water transport: U.S. Army Corps of Engineers (USACE). *Waterborne Commerce of the United States, Calendar Year 1996; Part 5 - National Summaries*. (New Orleans, LA: 1997).



table 5-4a

# Top Canadian Domestic Freight Interprovincial Pairs by Mode: 1996

(Thousands of metric tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		Québec to Ontario	6,845
N	N	Alberta to British Columbia	3,048
<b>Pipeline</b>		British Columbia to Alberta	2,060
N	N	Alberta to Saskatchewan	1,781
<b>Rail</b>		<b>Water transport</b>	
Alberta to British Columbia	29,335	Ontario to Québec	6,187
Newfoundland to Québec	20,875	Québec to Ontario	5,963
Saskatchewan to British Columbia	12,890	Nova Scotia to Newfoundland	810
Saskatchewan to Ontario	8,249	Nova Scotia to Québec	745
Ontario to Québec	4,677	Nova Scotia to New Brunswick	680
<b>Road</b>		<b>Intermodal</b>	
Ontario to Québec	7,002	N	N

**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows.

## SOURCES

Rail: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Rail data adapted by Transport Canada from Statistics Canada sources.)

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

map 2

# Top Canadian Domestic Freight Interprovincial Pairs by Mode: 1996

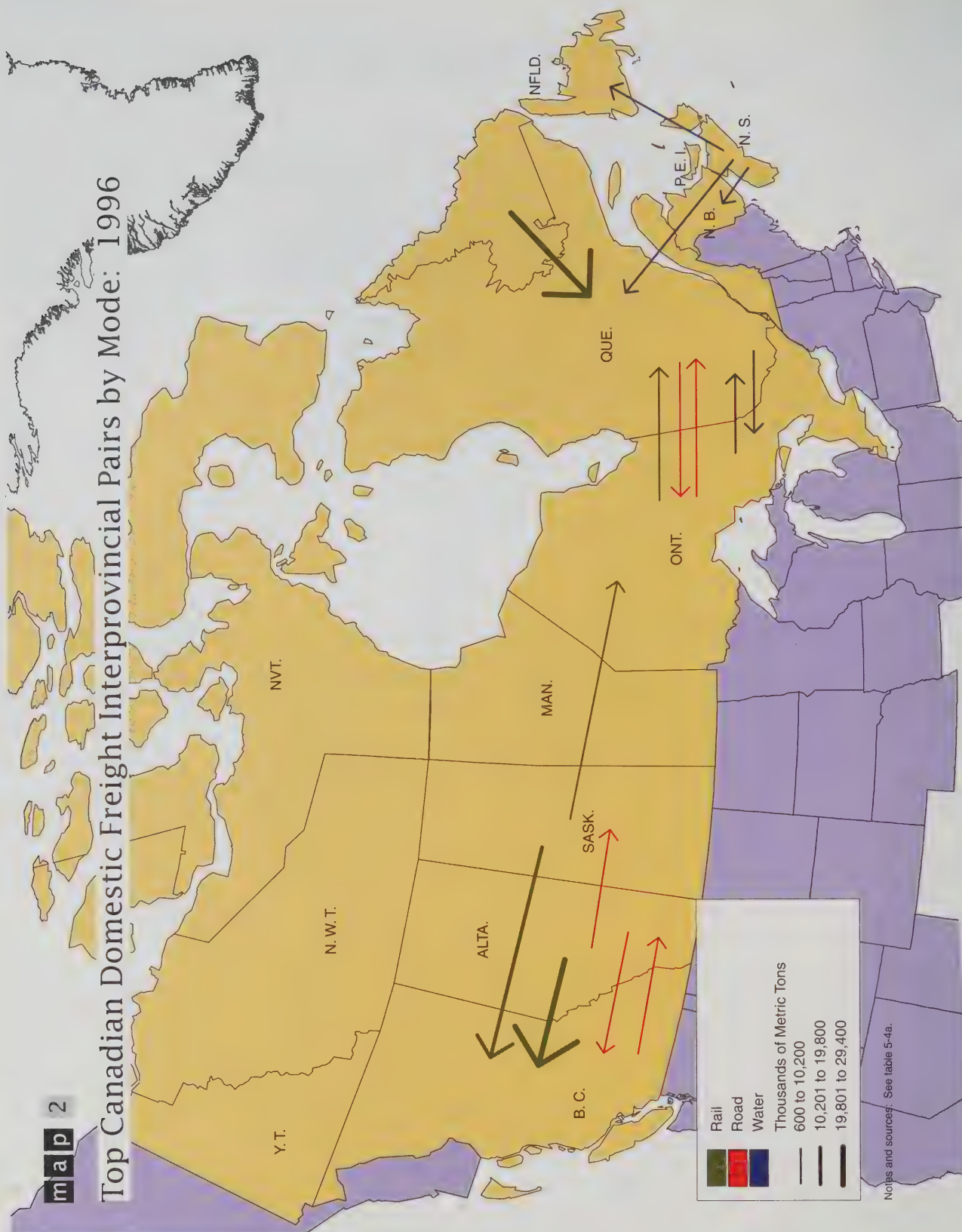


table 5-4b

# Top U.S. Domestic Freight Interstate Pairs by Mode: 1993

(Thousands of metric tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		Illinois to Indiana	18,008
California to Texas	39	Pennsylvania to New Jersey	16,991
California to New Jersey	27	Michigan to Ohio	15,056
Indiana to California	22	New Jersey to New York	14,587
New Jersey to California	16		
California to Georgia	15	<b>Water transport</b>	
		Illinois to Louisiana	18,416
<b>Pipeline</b>		Missouri to Louisiana	11,088
N	N	West Virginia to Pennsylvania	10,938
		Louisiana to Texas	8,828
<b>Rail</b>		Iowa to Louisiana	8,628
Wyoming to Texas	37,608		
West Virginia to Virginia	21,640	<b>Intermodal</b>	
Wyoming to Kansas	19,472	<b>(road and rail combination)</b>	
Wyoming to Missouri	18,507	Kentucky to Michigan	988
Illinois to Indiana	17,200	California to Michigan	313
		Ohio to California	298
<b>Road</b>		Illinois to California	261
Indiana to Illinois	25,978	Michigan to Florida	163

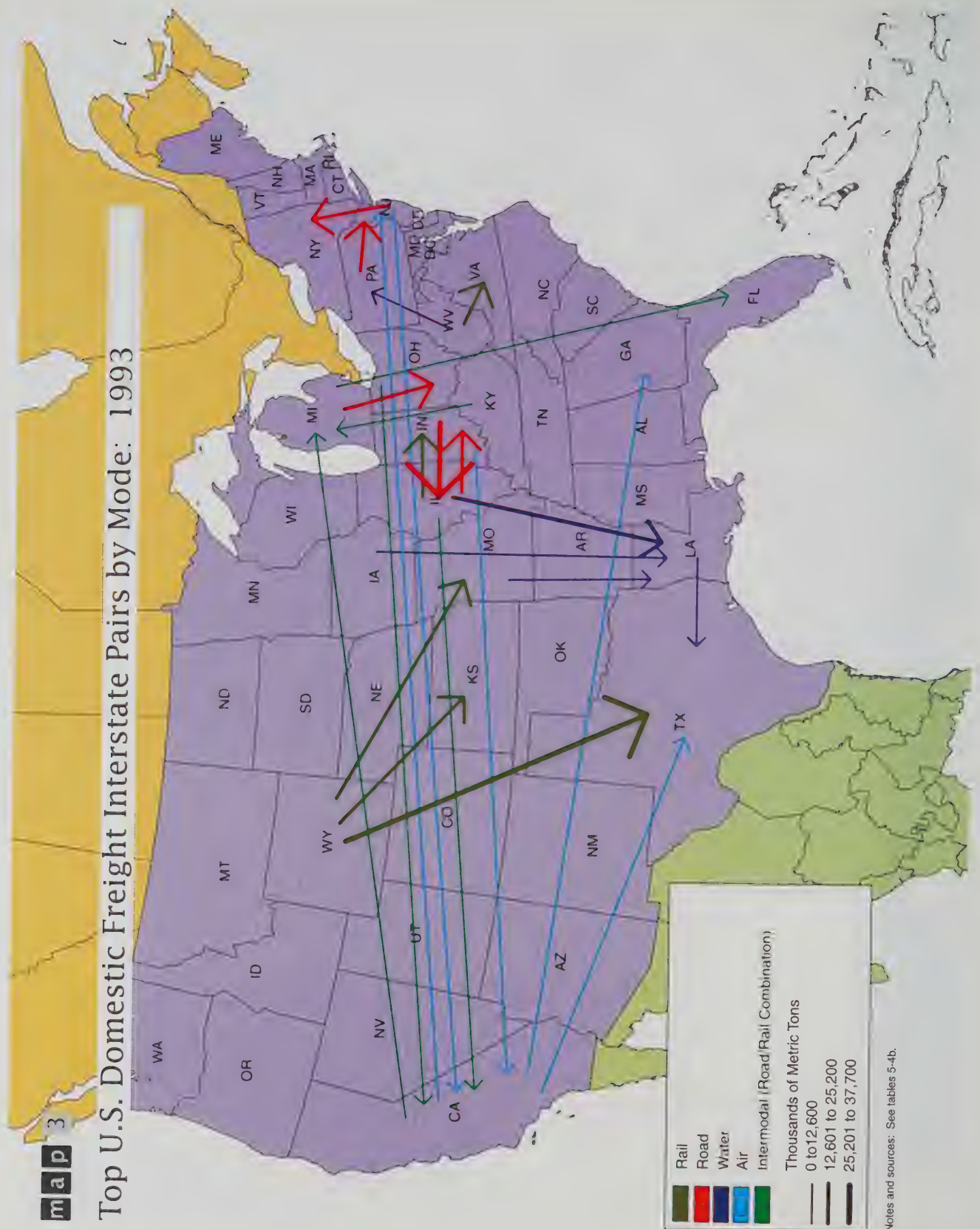
**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows.

**SOURCE:** U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).



# Top U.S. Domestic Freight Interstate Pairs by Mode: 1993





# Top Canadian Domestic Freight Area Pairs by Mode: 1996

(Thousands of metric tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		Toronto, Ont. to Hamilton, Ont.	964
N	N	Montréal, Que. to Québec, Que.	919
<b>Pipeline</b>		<b>Water transport</b>	
N	N	Sept-Îles/Pte-Noire, Que. to Hamilton, Ont.	3,294
		Havre-St-Pierre, Que. to Sorel, Que.	2,447
<b>Rail</b>		Port-Cartier, Que. to Hamilton, Ont.	2,065
N	N	Colborne, Ont. to Clarkson, Ont.	1,824
<b>Road</b>		Fraser River, B.C. to East Coast	
Hamilton, Ont. to Toronto, Ont.	2,716	Vancouver Island, B.C.	1,625
Toronto, Ont. to Montréal, Que.	2,061	<b>Intermodal</b>	
Montréal, Que. to Toronto, Ont.	1,623	N	N

**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows. Water data represent port to port pairs rather than metropolitan area pairs.

## SOURCES

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

table 5-5b

# Top Mexican Domestic Freight Area Pairs by Mode: 1996

(Thousands of metric tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	
Mexico City, D.F. to Guadalajara, Jal.	6	Mexico City, D.F. to Nuevo Laredo, Tamps.	12,700
Mexico City, D.F. to Tijuana, B.C.	5	Mexico City, D.F. to Monterrey, N.L.	7,400
Mexico City, D.F. to Cancún, Q. Roo.	4	Mexico City, D.F. to Guadalajara, Jal.	6,100
Guadalajara, Jal. to Mexico City, D.F.	4	Mexico City, D.F. to Veracruz, Ver.	4,700
Mexico City, D.F. to Monterrey, N.L.	4	Mexico City, D.F. to Toluca, Edo. de Mex.	4,400
<b>Pipeline</b>		<b>Water transport</b>	
U	U	Guerrero Negro, B.C.S. to Isla de Cedros, B.C.	7,400
<b>Rail</b>		Pajaritos, Ver. to Tuxpan, Ver.	4,000
Nuevo Laredo, Tamps. to Monterrey, N.L.	1,553	Salina Cruz, Oax. to Guaymas, Son.	2,300
Nuevo Laredo, Tamps. to Mexico City, D.F.	1,271	Salina Cruz, Oax. to Manzanillo, Col.	2,100
Veracruz, Ver. to Mexico City, D.F.	803	Salina Cruz, Oax. to Lázaro Cárdenas, Mich.	1,300
Ciudad Sahagún, Hgo. to Mexico City, D.F.	783	<b>Intermodal</b>	
Nuevo Laredo, Tamps. to Guadalajara, Jal.	697	N	N

**KEY:** N = Data are nonexistent. U = Data are unavailable.

## NOTES

Data represent one-way flows.

Rail: Figures of 1993, based on allocation studies (see Appendix B).

Road: Figures of 1994, from a survey of motor carrier vehicles on federal roads (see Appendix B).

Water transport: Data represent port to port pairs rather than metropolitan area pairs.

## SOURCES

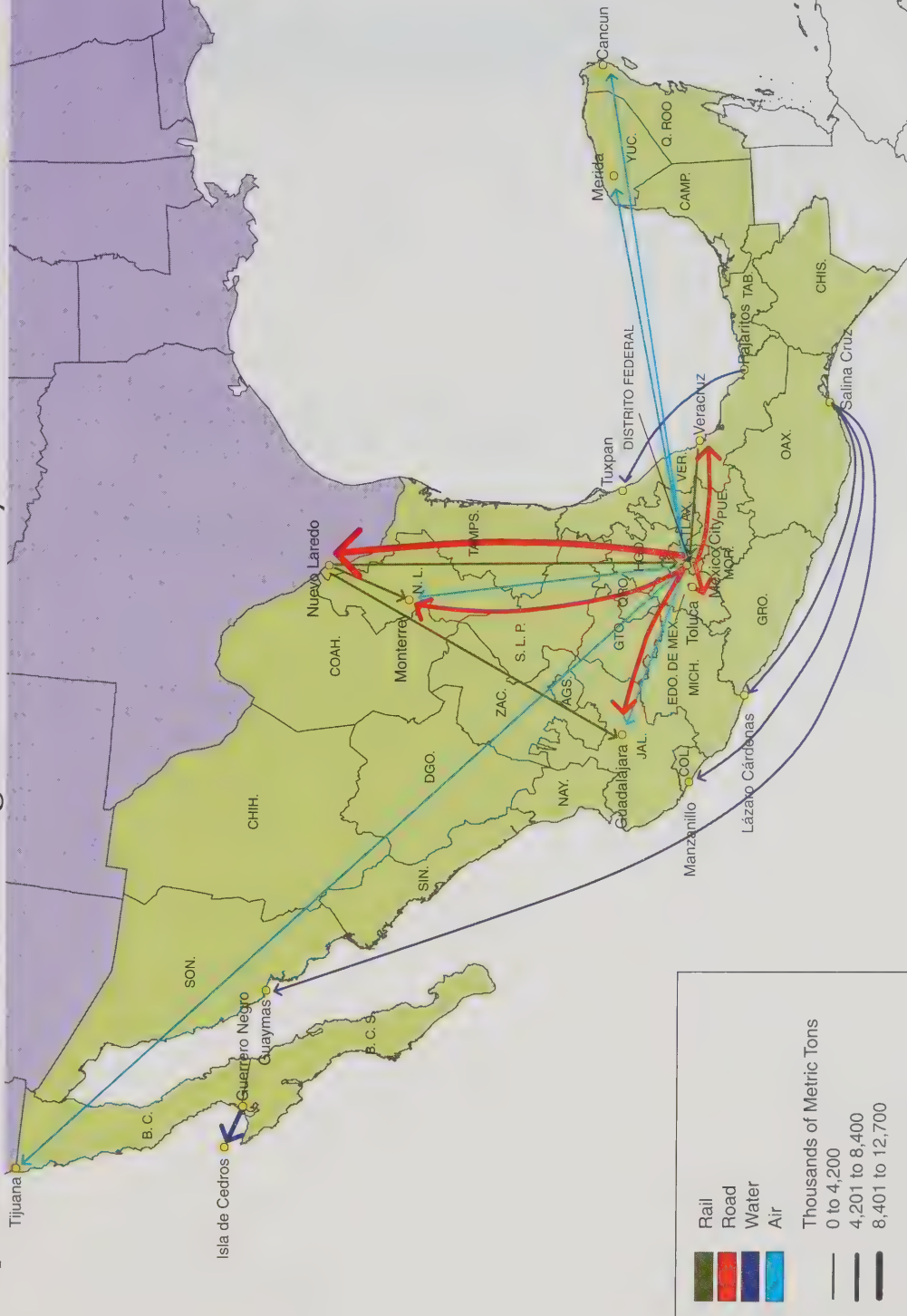
Air: Instituto Mexicano del Transporte based on special tabulation of the Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Sanfandila, Qro.: 1999).

Rail: Instituto Mexicano del Transporte. *Evaluación Económica de Mejoras a la Infraestructura del Sistema Nacional Ferroviario, Publicación Técnica No. 82*. Estimates included in this document are based on information from the Ferrocarriles Nacionales de México. (Sanfandila, Qro.: 1996).

Road: Instituto Mexicano del Transporte. Special tabulation from *Estudio de pesos y dimensiones de los vehiculos de carga que circulan en la red nacional de carreteras, 1994*. (Sanfandila, Qro.: 1999).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

# Top Mexican Domestic Freight Area Pairs by Mode: 1996



Notes and sources: See table 5-5b.





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s e c t i o n

6

# North American Merchandise Trade



table 6-1a

# Canadian Merchandise Trade With Mexico and the United States by Mode of Transportation

(Millions of current U.S. dollars)

	1990	1995	1996
<b>Total trade with Mexico</b>	<b>2,059</b>	<b>4,735</b>	<b>5,347</b>
Air	146	374	375
Water transport	214	339	431
Road	1,133	2,621	3,091
Rail	544	1,326	1,328
Pipeline and other <sup>a</sup>	22	75	121
<b>Exports to Mexico</b>	<b>562</b>	<b>835</b>	<b>922</b>
Air	87	143	122
Water transport	88	290	377
Road	244	295	301
Rail	142	108	122
Pipeline and other <sup>a</sup>	NS	NS	NS
<b>Imports from Mexico</b>	<b>1,497</b>	<b>3,899</b>	<b>4,426</b>
Air	58	231	253
Water transport	126	49	54
Road	889	2,326	2,791
Rail	402	1,218	1,207
Pipeline and other <sup>a</sup>	22	75	121
<b>Total trade with the United States</b>	<b>170,897</b>	<b>261,168</b>	<b>278,871</b>
Air	10,066	16,600	17,912
Water transport	6,852	6,538	6,905
Road	117,453	174,982	188,531
Rail	25,818	48,436	47,184
Pipeline and other <sup>a</sup>	10,709	14,612	18,339
<b>Exports to the United States</b>	<b>95,611</b>	<b>151,388</b>	<b>163,682</b>
Air	3,466	7,142	7,315
Water transport	5,096	4,936	5,134
Road	60,585	87,075	96,534
Rail	18,473	37,968	37,050
Pipeline and other <sup>a</sup>	7,991	14,267	17,648
<b>Imports from the United States</b>	<b>75,286</b>	<b>109,780</b>	<b>115,188</b>
Air	6,600	9,458	10,597
Water transport	1,756	1,601	1,771
Road	56,868	87,907	91,997
Rail	7,345	10,469	10,134
Pipeline and other <sup>a</sup>	2,718	345	691

<sup>a</sup>Mostly pipeline; also includes mail, parcel post and other miscellaneous modes of transportation.

**KEY:** NS = Not significant.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**table 6-1b**

# Mexican Merchandise Trade With Canada and the United States by Mode of Transportation

(Millions of current U.S. dollars)

	1990 <sup>a</sup>	1995	1996 <sup>p</sup>
<b>Total trade with Canada</b>	<b>917</b>	<b>3,354</b>	<b>3,914</b>
Air	U	264	237
Water transport	U	381	551
Road	U	1,174	1,501
Rail	U	1,301	1,467
Pipeline	NA	NA	NA
<b>Exports to Canada</b>	<b>458</b>	<b>1,979</b>	<b>2,170</b>
Air	U	94	103
Water transport	U	118	181
Road	U	557	606
Rail	U	1,094	1,272
Pipeline	NA	NA	NA
<b>Imports from Canada</b>	<b>458</b>	<b>1,374</b>	<b>1,744</b>
Air	U	170	134
Water transport	U	263	370
Road	U	617	895
Rail	U	207	195
Pipeline	NA	NA	NA
<b>Total trade with the United States</b>	<b>38,909</b>	<b>120,142</b>	<b>147,977</b>
Air	U	3,544	4,438
Water transport	U	10,905	14,620
Road	U	85,034	101,933
Rail	U	12,345	17,541
Pipeline	U	U	U
<b>Exports to the United States</b>	<b>18,418</b>	<b>66,336</b>	<b>80,541</b>
Air	U	1,794	2,097
Water transport	U	8,655	11,306
Road	U	46,272	53,752
Rail	U	8,784	12,681
Pipeline	U	U	U
<b>Imports from the United States</b>	<b>20,491</b>	<b>53,806</b>	<b>67,437</b>
Air	U	1,750	2,341
Water transport	U	2,250	3,314
Road	U	38,762	48,181
Rail	U	3,561	4,859
Pipeline	U	U	U

<sup>a</sup>Data for 1990 does not include maquiladora trade.

**KEY:** NA = Not applicable. p = Data are preliminary. U = Data are unavailable.



Mexican Merchandise Trade With Canada and the United States by Mode of Transportation—Continued

NOTES

See Appendix B for information on the proportion of maquiladora trade in 1995 and 1996.

Mexican total merchandise trade with Canada and the United States: Individual modes do not sum to total trade figures because not all Mexican modes of transportation are included here. See Appendix B for Mexican modes not specifically identified on this table.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**table 6-1c**

# U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

(Millions of current U.S. dollars)

	1990	1995	1996
<b>Total trade with Canada</b>	<b>175,054</b>	<b>272,575</b>	<b>290,194</b>
Air	8,938	17,074	18,866
Water transport	10,969	6,558	7,034
Road	N	186,388	201,144
Rail	N	55,269	55,490
Pipeline	N	10,728	12,958
<b>Exports to Canada</b>	<b>83,674</b>	<b>127,226</b>	<b>133,688</b>
Air	6,036	10,935	12,541
Water transport	1,938	1,882	2,066
Road	N	97,423	102,743
Rail	N	15,272	15,679
Pipeline	N	121	162
<b>Imports from Canada</b>	<b>91,380</b>	<b>145,349</b>	<b>156,506</b>
Air	2,902	6,139	6,325
Water transport	9,032	4,676	4,968
Road	N	88,965	98,401
Rail	N	39,997	39,811
Pipeline	N	10,607	12,796
<b>Total trade with Mexico</b>	<b>58,346</b>	<b>107,977</b>	<b>129,724</b>
Air	1,950	3,158	4,232
Water transport	7,291	9,914	11,941
Road	N	78,929	92,442
Rail	N	13,832	17,417
Pipeline	N	28	10
<b>Exports to Mexico</b>	<b>28,279</b>	<b>46,292</b>	<b>56,761</b>
Air	1,378	1,775	2,362
Water transport	1,527	2,200	3,143
Road	N	35,914	44,092
Rail	N	4,694	5,119
Pipeline	N	1	2
<b>Imports from Mexico</b>	<b>30,157</b>	<b>61,685</b>	<b>72,963</b>
Air	572	1,382	1,870
Water transport	5,764	7,713	8,797
Road	N	43,014	48,350
Rail	N	9,138	12,298
Pipeline	N	27	8

**KEY:** N = Data are nonexistent.

**NOTE:** Total trade with Canada and Mexico: Individual modes do not sum to total trade figures because not all U.S. modes of transportation are included here. See Appendix B for a list of U.S. modes not specifically identified on this table. In addition, in some cases, a summation of the individual modal categories will exceed the reported total trade value because transshipment data are included in the data for land modes of transportation (road, rail and pipeline). Transshipment data cannot be separated from the modal totals for road, rail and pipeline for 1995 and 1996. For an explanation of transshipment data, see Appendix B. Also see Appendix B for information on modal percentage shares, using 1997 data from which transshipment data have been excluded from the land modes.

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**t a b l e 6-1c**

**U.S. Merchandise Trade With Canada and Mexico  
by Mode of Transportation—*Continued***

**SOURCES**

Total trade: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

Air and water: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *FT920 U.S. Merchandise Trade*. (Washington, DC: December 1990, 1995 and 1996).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

table 6-2a

# Canadian Merchandise Trade With Mexico and the United States by Mode of Transportation

(Thousands of metric tons)

	1990 <sup>e</sup>	1995 <sup>e</sup>	1996 <sup>e</sup>
<b>Total trade with Mexico</b>	<b>2,054</b>	<b>4,621</b>	<b>4,669</b>
Air	28	73	46
Water transport	1,304	2,509	2,597
Road	416	949	777
Rail	290	442	375
Pipeline and other <sup>a</sup>	16	649	875
<b>Exports to Mexico</b>	<b>692</b>	<b>2,231</b>	<b>2,184</b>
Air	7	24	5
Water transport	459	1,892	1,946
Road	78	144	79
Rail	149	170	154
Pipeline and other <sup>a</sup>	NS	NS	NS
<b>Imports from Mexico</b>	<b>1,362</b>	<b>2,390</b>	<b>2,485</b>
Air	22	50	41
Water transport	846	616	651
Road	338	804	698
Rail	141	271	221
Pipeline and other <sup>a</sup>	16	649	875
<b>Total trade with the United States</b>	<b>245,811</b>	<b>354,346</b>	<b>367,986</b>
Air	2,717	2,458	2,379
Water transport	67,893	72,495	77,371
Road	67,113	95,450	98,126
Rail	40,948	60,327	61,232
Pipeline and other <sup>a</sup>	67,141	123,616	128,879
<b>Exports to the United States</b>	<b>175,621</b>	<b>268,486</b>	<b>277,525</b>
Air	180	417	205
Water transport	40,047	45,260	48,414
Road	38,441	51,939	54,305
Rail	32,281	48,323	49,535
Pipeline and other <sup>a</sup>	64,672	122,546	125,065
<b>Imports from the United States</b>	<b>70,191</b>	<b>85,860</b>	<b>90,461</b>
Air	2,537	2,041	2,173
Water transport	27,846	27,236	28,956
Road	28,671	43,510	43,821
Rail	8,667	12,004	11,697
Pipeline and other <sup>a</sup>	2,470	1,070	3,814

<sup>a</sup>Mostly pipeline moves; also includes mail, parcel post and other miscellaneous modes of transportation.

**KEY:** e = Data are estimated. NS = Not significant.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).



**table 6-2b**

# Mexican Merchandise Trade With Canada and the United States by Mode of Transportation

(Thousands of metric tons)

	1990	1995	1996
<b>Total trade with Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 2	2	2
Water transport	1,425	<sup>b</sup> 3,427	2,808
Road	N	N	N
Rail	U	U	U
Pipeline	NA	NA	NA
<b>Exports to Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 1	1	1
Water transport	1,051	<sup>b</sup> 1,717	988
Road	N	N	N
Rail	U	U	U
Pipeline	NA	NA	NA
<b>Imports from Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 1	1	1
Water transport	374	<sup>b</sup> 1,710	1,820
Road	N	N	N
Rail	U	U	U
Pipeline	NA	NA	NA
<b>Total trade with the United States</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 70	116	141
Water transport	59,270	<sup>b</sup> 72,473	89,902
Road	N	N	38,728
Rail	U	U	15,120
Pipeline	U	U	U
<b>Exports to the United States</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 30	60	74
Water transport	49,699	<sup>b</sup> 61,698	77,648
Road	N	N	14,482
Rail	U	U	4,813
Pipeline	U	U	U
<b>Imports from the United States</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 40	56	67
Water transport	9,571	<sup>b</sup> 10,775	12,254
Road	N	N	24,246
Rail	U	U	10,307
Pipeline	U	U	U

<sup>a</sup>Data for 1990 are nonexistent. Data in this table represent 1992.

<sup>b</sup>Data for 1995 are nonexistent. Data in this table represent 1994.

**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

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**t a b l e 6-2b****Mexican Merchandise Trade With Canada and the  
United States by Mode of Transportation—Continued****SOURCES**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. Special tabulation. (Mexico City, D.F.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

Road and rail, 1996: Instituto Mexicano del Transporte. Special tabulations based on data from the Secretaría de Comercio y Fomento Industrial and U.S. Bureau of Transportation Statistics. (Querétaro, Qro.: 1998).

**table 6-2c**

# U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

(Thousands of metric tons)

	1990	1995	1996
<b>Total trade with Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	222	252	269
Water transport	65,447	68,509	72,013
Road	N	N	N
Rail	N	N	N
Pipeline	N	N	N
<b>Exports to Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	171	215	225
Water transport	25,194	25,721	24,906
Road	N	N	N
Rail	N	N	N
Pipeline	N	N	N
<b>Imports from Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	51	38	44
Water transport	40,253	42,788	47,108
Road	N	53,564	57,805
Rail	N	46,270	48,815
Pipeline	N	61,385	62,889
<b>Total trade with Mexico</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	44	64	83
Water transport	52,140	72,351	75,940
Road	N	N	N
Rail	N	N	N
Pipeline	N	N	N
<b>Exports to Mexico</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	26	28	37
Water transport	9,026	8,632	13,097
Road	N	N	N
Rail	N	N	N
Pipeline	N	N	N
<b>Imports from Mexico</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	18	36	46
Water transport	43,114	63,719	62,843
Road	N	N	14,482
Rail	N	N	4,814
Pipeline	N	N	113

**KEY:** N = Data are nonexistent.

## NOTES

Imports from Canada: The U.S. Customs Service began to require shipping weight for U.S. imports from Canada by all modes of transportation in 1990. However, it did not become possible to disaggregate the land modes (road, rail and pipeline) until 1994.

Imports from Mexico: The U.S. Customs Service began to require shipping weight for U.S. imports from Mexico by land modes of transportation (road, rail and pipeline) in April 1995.

Road, rail and pipeline exports: For 1990, 1995 and 1996, the U.S. Census Bureau did not require shippers to report weight for export shipments to Canada or Mexico for these modes of transportation.

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**t a b l e 6-2c****U.S. Merchandise Trade With Canada and Mexico  
by Mode of Transportation—Continued****SOURCES**

Total trade: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

Air and water: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *FT920 U.S. Merchandise Trade*. (Washington, DC: December 1990, 1995 and 1996).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).



# Top Canadian Gateways for North American Merchandise Trade by Mode: 1996

(Current value in millions of U.S. dollars)

Port name	Exports			Imports			Total North American trade
	To Mexico	To the United States	Total North American	From Mexico	From the United States	Total North American	
<b>Air</b>							
Toronto-Pearson Int. Air, Ont.	63	4,125	4,188	151	4,149	4,300	8,488
Montréal-Dorval Int. Air, Que.	19	1,422	1,441	23	1,984	2,007	3,448
Montréal-Mirabel Int. Air, Que.	5	726	731	10	678	689	1,420
Vancouver-Int. Airport, B.C.	1	344	345	9	860	869	1,214
Calgary, Alta.	21	322	343	17	574	590	933
Hamilton, Ont.	1	0	1	10	344	354	355
Winnipeg-Int. Airport, Man.	0	43	43	5	276	280	324
Ottawa, Ont.	2	215	217	1	94	95	312
Edmonton, Alta.	0	5	6	3	258	260	266
Halifax, N.S.	0	25	25	0	98	98	124
<b>Water Transport</b>							
Saint John, N.B.	1	1,213	1,214	NS	27	27	1,241
Montréal-Main Long Room, Que.	18	321	339	24	146	171	510
Halifax, N.S.	1	416	417	4	28	33	450
Sept-Îles, Que.	0	376	376	1	34	35	411
Port Hawkesbury, N.S.	0	381	381	NS	7	7	388
Hamilton, Ont.	NS	NS	NS	1	355	355	355
Nanaimo, B.C.	0	345	345	NS	5	5	351
Vancouver, B.C.	0	NS	NS	9	233	242	242
Baie-Comeau, Que.	6	49	56	NS	176	176	232
Sault Ste. Marie, Ont.	0	NS	NS	NS	150	150	150
<b>Road</b>							
Windsor-Ambassador Bridge, Ont.	185	34,769	34,955	1,409	30,648	32,057	67,011
Fort Erie, Ont.	17	19,094	19,112	72	10,024	10,095	29,207
Sarnia, Ont.	22	12,345	12,367	687	10,992	11,679	24,046
Lacolle, Que.	11	7,032	7,044	37	2,897	2,934	9,978
Pacific Highway, B.C.	0	3,895	3,895	98	3,769	3,867	7,763
Phillipsburg, Que.	0	4,393	4,393	6	1,872	1,878	6,271
Emerson, Man.	0	2,875	2,875	18	2,603	2,620	5,496
Niagara Falls, Ont.	9	46	56	25	4,053	4,078	4,133
Coutts, Alta.	6	1,930	1,936	39	1,878	1,917	3,853
North Portal, Sask.	9	1,655	1,664	7	1,687	1,694	3,358

**table** 6-3a

# Top Canadian Gateways for North American Merchandise Trade by Mode: 1996—*Continued*

(Current value in millions of U.S. dollars)

Port name	Exports			Imports			Total North American trade
	To Mexico	To the United States	Total North American	From Mexico	From the United States	Total North American	
<b>Rail</b>							
Sarnia, Ont.	37	10,157	10,194	659	1,515	2,174	12,368
Windsor-Ambassador Bridge, Ont.	9	8,207	8,216	420	1,278	1,698	9,914
Fort Erie, Ont.	0	7,296	7,296	2	41	43	7,339
Fort Frances, Ont.	60	3,257	3,316	NS	64	64	3,380
Pacific Highway, B.C.	2	1,601	1,603	4	28	32	1,635
North Portal, Sask.	3	1,323	1,326	NS	0	0	1,326
Huntington, B.C.	0	1,143	1,143	0	180	181	1,323
Emerson, Man.	3	964	968	NS	119	119	1,087
Lacolle, Que.	1	672	673	NS	118	118	790
Montréal, Que.	0	NS	NS	30	706	736	736
<b>Pipeline and other</b>							
Coutts, Alta.	0	3,188	3,188	NS	1	1	3,189
Sarnia, Ont.	0	2,314	2,314	NS	232	232	2,546
Emerson, Man.	0	2,092	2,092	NS	1	1	2,093
Pacific Highway, B.C.	0	1,331	1,331	NS	2	2	1,333
Lacolle, Que.	0	1,125	1,125	NS	0	0	1,125
Windsor-Ambassador Bridge, Ont.	0	918	918	NS	4	4	922
Niagara Falls, Ont.	0	726	726	2	1	2	729
Prescott, Ont.	0	674	674	NS	0	0	674
Fort Erie, Ont.	0	651	651	NS	5	5	656
Windsor-Detroit/Can. Tunnel, Ont.	0	238	238	NS	0	0	238

**KEY:** NS = Not significant.**NOTE:** Pipeline and other: Includes mostly pipeline moves, but also includes mail, parcel post and other miscellaneous modes of transportation. It is not possible to separate pipeline data from these other modes of transportation.**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

# Top Mexican Gateways for North American Merchandise Trade by Mode: 1996<sup>p</sup>

(Current value in millions of U.S. dollars)

Port name	Exports			Imports			Total North American trade
	To Canada	To the United States	Total North American	From Canada	From the United States	Total North American	
<b>Air</b>							
Mexico City, D.F.	34	573	607	97	1,344	1,440	2,047
Guadalajara, Jal.	50	939	989	28	589	617	1,606
Monterrey, N.L.	17	122	138	5	114	119	257
Toluca, Edo. de Mex.	1	131	132	2	49	51	183
<b>Water Transport</b>							
Ciudad del Carmen, Camp. <sup>a</sup>	137	5,477	5,613	U	39	39	5,652
Coatzacoalcos, Ver.	3	3,606	3,609	2	259	261	3,870
Veracruz, Ver.	12	900	912	108	1,011	1,119	2,031
Manzanillo Col.	6	322	328	158	80	238	565
Tuxpan, Ver.	0	5	5	1	545	546	551
Altamira, Tamps.	3	181	184	7	357	364	548
Lázaro Cárdenas, Mich.	3	217	220	55	101	156	375
Guaymas, Son.	U	31	U	21	52	73	U
<b>Land</b>							
Nuevo Laredo, Tamps.	792	18,145	18,937	722	16,188	16,909	35,847
Ciudad Juárez, Chih.	19	12,224	12,243	18	11,805	11,823	24,066
Tijuana, B.C.	16	8,433	8,449	49	5,764	5,813	14,262
Matamoros, Tamps.	25	3,729	3,754	47	4,624	4,672	8,425
Ciudad Reynosa, Tamps.	34	3,621	3,655	22	3,394	3,415	7,070
Piedras Negras, Coah.	872	3,482	4,354	91	1,905	1,996	6,350
Colombia, N.L.	64	2,685	2,749	42	1,110	1,152	3,901

<sup>a</sup>Represents Cayo Arcas, Camp. which is an offshore platform for oil trade.

**KEY:** p = Data are preliminary. U = Data are unavailable.

## NOTES

**Air:** These four airports account for approximately 88 percent of Mexican trade by air with Canada and the United States. Data for other airports are unavailable.

**Water transport:** These eight water ports account for approximately 90 percent of Mexican trade by water with Canada and the United States. Data for other water ports are unavailable.

**Land:** Data are unavailable to separate land ports by the specific modes of road, rail and pipeline. Land data in this table include both road and rail modes.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**t a b l e 6-3c**

## Top U.S. Gateways for North American Merchandise Trade by Mode: 1996

(Current value in millions of U.S. dollars)

Port name	Exports			Imports			Total North American trade
	To Canada	To Mexico	Total North American	From Canada	From Mexico	Total North American	
Air							
Cleveland, OH	3,607	236	3,843	2,983	210	3,193	7,036
New Orleans, LA	2,193	210	2,403	986	198	1,183	3,586
Los Angeles International Airport, CA	468	320	788	140	324	464	1,251
Newark, NJ	110	13	123	693	14	707	830
Sandusky, OH	811	0	811	8	0	8	819
John F. Kennedy International Airport, NY	265	201	466	269	78	347	813
Detroit, MI	449	2	450	262	1	263	713
Buffalo-Niagara Falls, NY	651	0	651	40	1	41	692
San Francisco International Airport, CA	367	54	422	201	37	238	659
Miami International Airport, FL	75	298	373	22	112	134	507
Water Transport							
Port of Houston, TX	64	929	992	104	2,128	2,232	3,225
Port of Lake Charles, LA	75	11	86	0	887	888	973
Port of Corpus Christie, TX	254	215	469	17	486	503	973
Port of New Orleans, LA	47	455	502	35	435	470	972
Port of Baton Rouge, LA	25	53	78	53	314	367	446
Port of New York, NY	80	10	90	231	113	344	434
Port of Mobile, AL	1	69	70	92	224	317	386
Port of Freeport, TX	21	2	23	12	292	304	326
Port of San Juan, PR	0	32	32	145	88	233	265
Port of Charleston, SC	3	49	51	187	16	203	255
Road							
Port of Detroit, MI	37,179	0	37,179	30,681	0	30,681	67,859
Port of Buffalo-Niagara Falls, NY	25,634	0	25,634	19,434	0	19,434	45,068
Port of Laredo, TX	0	15,923	15,923	0	12,512	12,512	28,436
Port of El Paso, TX	0	9,259	9,259	0	11,601	11,601	20,861
Port of Port Huron, MI	9,034	0	9,034	11,477	0	11,477	20,511
Port of Champlain-Rouses Point, NY	5,701	0	5,701	7,385	0	7,385	13,086
Port of Otay Mesa, CA	0	4,691	4,691	0	6,975	6975	11,666
Port of Blaine, WA	5,603	0	5,603	6,975	0	6,975	9,363
Port of Alexandria Bay, NY	2,925	0	2,925	4,907	0	4,907	7,832
Port of Highgate Springs-Alburg, VT	2,289	0	2,289	4,757	0	4,757	7,046



# Top U.S. Gateways for North American Merchandise Trade by Mode: 1996—*Continued*

(Current value in millions of U.S. dollars)

Port name	Exports			Imports			Total North American trade
	To Canada	To Mexico	Total North American	From Canada	From Mexico	Total North American	
<b>Rail</b>							
Port of Detroit, MI	6,560	0	6,560	10,298	0	10,298	16,868
Port of Buffalo-Niagara Falls, NY	5,192	0	5,192	7,374	0	7,374	12,566
Port of Port Huron, MI	2,021	0	2,021	9,638	0	9,638	11,659
Port of Laredo, TX	0	2,192	2,192	0	8,138	8,138	10,330
Port of Eagle Pass, TX	0	2,089	2,089	0	1,852	1,852	3,941
Port of International Falls-Ranier, MN	356	0	356	3,227	0	3,227	3,583
Port of Portal, ND	367	0	367	1,122	0	1,122	1,488
Port of Nogales, AZ	0	149	149	0	1,255	1,255	1,404
Port of Trout River, NY	1	0	1	1,320	0	1,320	1,321
Port of Blaine, WA	248	0	248	1,045	0	1,045	1,293
<b>Pipeline</b>							
Port of Port Huron, MI	62	0	62	1,106	0	1,106	1,168
Port of Ogdensburg, NY	0	0	0	627	0	627	627
Port of Buffalo-Niagara Falls, NY	67	0	67	547	0	547	614
Port of Sweetgrass, MT	NS	0	NS	535	0	535	535
Port of Pembina, ND	0	0	0	441	0	441	441
Port of Piegan, MT	0	0	0	272	0	272	272
Port of Sumas, WA	0	0	0	209	0	209	209
Port of Raymond, MT	0	0	0	120	0	120	120
Port of Detroit, MI	31	0	0	54	0	54	85
Port of International Falls-Ranier, MN	2	0	2	32	0	32	34

**KEY:** NS = Not significant.

## NOTES

**Air:** Values for some airports may include a low (generally less than 2-3 percent of the total value) level of small user-fee airports located in the same regional area. In addition, due to confidentiality regulations, data for nearby courier operations are included in certain airport totals.

**Road, rail and pipeline:** Data for individual ports includes transshipments (see Appendix B for definition).

**Road, Otay Mesa, CA:** Data also include trade by truck that was reported for San Ysidro, CA, and the San Diego Customs District.

## SOURCES

**Air:** U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. Transportation Branch. Special tabulation. (Washington, DC: 1998).

**Water transport:** U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

**Road, rail and pipeline:** U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

**t a b l e** 6-4a**Top Mexican Maritime Intransit Shipment Ports<sup>a</sup>:  
January-June 1997**

(Thousands of U.S. dollars or metric tons)

	Value	Weight
<b>To/from the United States</b>		
<b>U.S. overseas exports transshipped through Mexican maritime ports</b>	<b>N</b>	<b>21.6</b>
Port of Manzanillo, Col.	N	15.7
Port of Veracruz, Ver.	N	5.4
Port of Lázaro Cárdenas, Mich.	N	0.3
Port of Progreso, Yuc.	N	0.2
Port of Ensenada, B.C.	N	0.1
<b>U.S. overseas imports transshipped through Mexican maritime ports</b>	<b>N</b>	<b>92.4</b>
Port of Tampico, Tamps.	N	50.6
Port of Tuxpan, Ver.	N	22.9
Port of Veracruz, Ver.	N	10.2
Port of Manzanillo, Col.	N	4.6
Port of Altamira, Tamps.	N	4.2
<b>To/from Canada</b>		
<b>Canadian overseas exports transshipped through Mexican maritime ports</b>	<b>N</b>	<b>0</b>
<b>Canadian overseas imports transshipped through Mexican maritime ports</b>	<b>N</b>	<b>0</b>

<sup>a</sup>Ports are ranked on total intransit shipment weight.**KEY:** N = Data are nonexistent.**NOTE:** Data are unavailable for 1996.**SOURCE:** Instituto Mexicano del Transporte. Special tabulation based on 1997 data from the Journal of Commerce. *Port Import Export Reporting Service (PIERS)*. (Querétaro, Qro.: 1998).

Top U.S. Maritime Intransit Shipment Ports<sup>a</sup>: 1996

(Thousands of U.S. dollars or metric tons)

	Value	Weight
<b>To/from Canada</b>		
<b>Canadian overseas exports transshipped through U.S. maritime ports</b>	<b>199,519</b>	<b>73.1</b>
Port of Los Angeles, CA	119,143	30.5
Port of Long Beach, CA	70,791	38.3
Port of Norfolk, VA	4,964	2.3
Port of New York, NY	1,111	0.95
Port of Houston, TX	822	0.32
<b>Canadian overseas imports transshipped through U.S. maritime ports</b>	<b>442,627</b>	<b>84.3</b>
Port of Superior, WI	132,496	1.6
Port of Los Angeles, CA	83,079	11.4
Port of Duluth, MN	55,096	0.7
Port of Brownsville, TX	44,438	28.4
Port of Seattle, WA	37,781	8.3
<b>To/from Mexico</b>		
<b>Mexican overseas exports transshipped through U.S. maritime ports</b>	<b>420,320</b>	<b>1,111.1</b>
Port of Long Beach, CA	171,012	21.7
Port of Brownsville, TX	90,559	53.3
Port of Los Angeles, CA	46,716	13.5
Port of Charleston, SC	39,688	5.4
Port of Houston, TX	21,969	4.2
<b>Mexican overseas imports transshipped through U.S. maritime ports</b>	<b>584,373</b>	<b>1,111.7</b>
Port of Los Angeles, CA	161,817	44.4
Port of Long Beach, CA	133,015	46.0
Port of Portland, ME	126,073	889.6
Port Everglades, FL	34,136	1.9
Port of Miami, FL	30,612	3.0

<sup>a</sup>Ports are ranked on total intransit shipment value.**SOURCE:** U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

**table 6-5a**

# Top Land Freight Crossing Ports, Canadian-U.S. Border: 1996

(Thousands of truck or train crossings)

Port name	Northbound	Southbound	Total
<b>Truck</b>			
<b>Canadian-U.S. border, total</b>	<b>5,465</b>	<b>5,405</b>	<b>10,870</b>
<b>Detroit, MI/Windsor, Ont.</b>	<b>C</b>	<b>1,332</b>	<b>U</b>
Ambassador/Windsor Bridge	C	N	N
Windsor-Detroit Tunnel	137	N	N
<b>Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.</b>	<b>1,028</b>	<b>996</b>	<b>2,024</b>
Buffalo, NY/Fort Erie, Ont.	601	N	N
Niagara Falls, NY/Niagara Falls, Ont.	427	N	N
Queenston Bridge	419	N	N
Rainbow Bridge	N	N	N
Whirlpool Bridge	8	N	N
<b>Port Huron, MI/Sarnia, Ont.</b>	<b>547</b>	<b>636</b>	<b>1,183</b>
<b>Blaine, WA/Douglas and Pacific Highway, B.C.</b>	<b>392</b>	<b>402</b>	<b>794</b>
Blaine, WA/Douglas, B.C.	N	N	N
Blaine, WA/Pacific Highway, B.C.	392	N	N
<b>Champlain-Rouses Pt., NY/Lacolle (Routes 15, 221,223), Que.</b>	<b>313</b>	<b>279</b>	<b>592</b>
Champlain, NY/Lacolle Route 15, Que.	305	N	N
Rouses Pt., NY/Lacolle Routes 221 and 223, Que.	9	N	N
<b>Rail (number of trains)</b>			
<b>Canadian-U.S. border, total</b>	<b>C</b>	<b>31</b>	<b>U</b>
<b>Detroit, MI/Windsor, Ont.</b>	<b>C</b>	<b>4</b>	<b>N</b>
Ambassador/Windsor Bridge	C	N	N
Windsor-Detroit Tunnel	C	N	N
<b>Port Huron, MI/Sarnia, Ont.</b>	<b>C</b>	<b>4</b>	<b>N</b>
<b>Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.</b>	<b>C</b>	<b>4</b>	<b>N</b>
Buffalo, NY/Fort Erie, Ont.	C	N	N
Niagara Falls, NY/Niagara Falls, Ont.	C	N	N
Queenston Bridge	C	N	N
Rainbow Bridge	C	N	N
Whirlpool Bridge	C	N	N
<b>International Falls-Rainer, MN/Fort Frances, Ont.</b>	<b>C</b>	<b>3</b>	<b>N</b>
<b>Warroad, MN/Sprague, Man.</b>	<b>C</b>	<b>3</b>	<b>N</b>

**KEY:** C = Data are confidential. N = Data are nonexistent. U = Data are unavailable.

## NOTES

Truck: Data represent the number of truck crossings, not the number of unique vehicles.

Rail: Data on the number of rail cars was not available for all ports on the U.S.-Canadian border. The number of trains has been used instead. Table 6-5b does contain data for the number of rail cars on the U.S.-Mexican border.

## SOURCES

### Northbound

Statistics Canada. Culture, Tourism and the Center for Education Statistics Division. Special tabulations. (Ottawa, Ont.: 1998).

### Southbound

U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).



## Top Land Freight Crossing Ports, Mexican-U.S. Border: 1996

(Thousands of truck or rail car crossings)

Port name	Northbound	Southbound	Total
<b>Truck</b>			
<b>Mexico-U.S. border, total</b>	<b>3,235</b>	<b>N</b>	<b>N</b>
Laredo, TX/Nuevo Laredo, Tamps.	1,016	517	U
El Paso, TX/Ciudad Juárez, Chih.	556	N	N
Otay Mesa, CA/Tijuana, B.C.	531	N	N
Nogales, AZ/Nogales, Son.	229	N	N
Brownsville, TX/Matamoros, Tamps.	226	198	424
<b>Rail (number of full and empty rail cars)</b>			
<b>Mexico-U.S. border, total</b>	<b>286</b>	<b>201</b>	<b>487</b>
Laredo, TX/Nuevo Laredo, Tamps.	116	112	228
Eagle Pass, TX/Piedras Negras, Coah.	62	39	101
Brownsville, TX/Matamoros, Tamps.	51	16	67
El Paso, TX/Ciudad Juárez, Chih.	22	16	38
Nogales, AZ/ Nogales, Son.	25	6	31

**KEY:** N = Data are nonexistent. U = Data are unavailable.**NOTES****North and Southbound**

Truck: Data represent the number of truck crossings, not the number of unique vehicles.

**Northbound**

Trucks: Data are for loaded and empty trucks.

Rail: Data include both loaded and unloaded rail cars.

**Southbound**Laredo, TX/Nuevo Laredo, Tamps., Trucks: Data are for **loaded** trucks only.

Brownsville, TX/Matamoros, Tamps., Trucks: Data are for loaded and empty trucks.

Rail: Data include both loaded and unloaded rail cars.

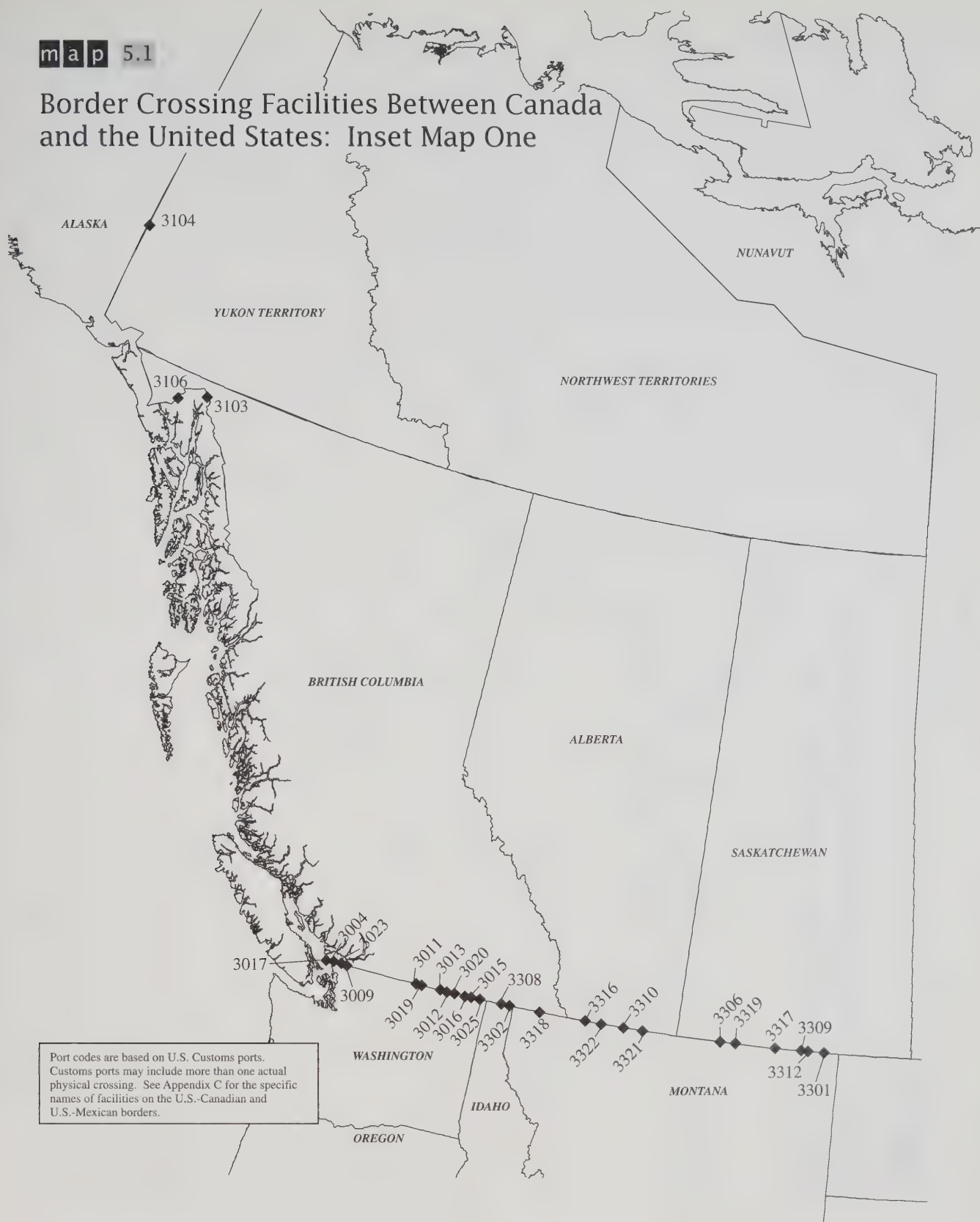
**SOURCES****Northbound**U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).**Southbound**Trucks: Data compiled by Texas A&M International University, Texas Center for Border Economic and Enterprise Development based on original data from bridge operators. Web site: [www.tamui.edu/coba/txcntr/](http://www.tamui.edu/coba/txcntr/)Rail: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte 1996*. (Querétaro, Qro.: 1998).

# Inset Maps for North American Border Crossing Facilities



# map 5.1

## Border Crossing Facilities Between Canada and the United States: Inset Map One



## Border Crossing Facilities Between Canada and the United States: Inset Map Two

MANITOBA

ONTARIO

NORTH DAKOTA

MINNESOTA

WISCONSIN

MICHIGAN

IOWA

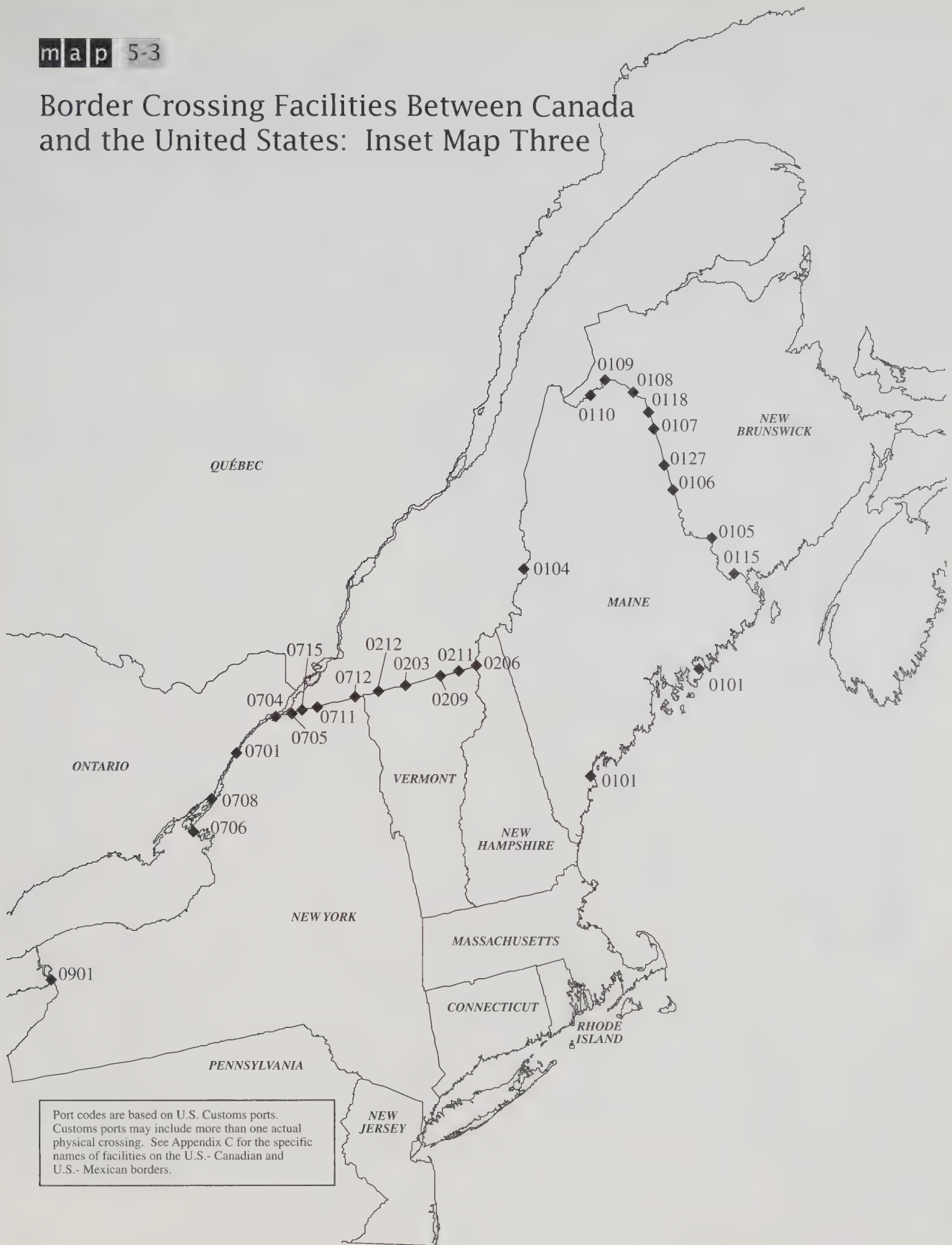
SOUTH DAKOTA

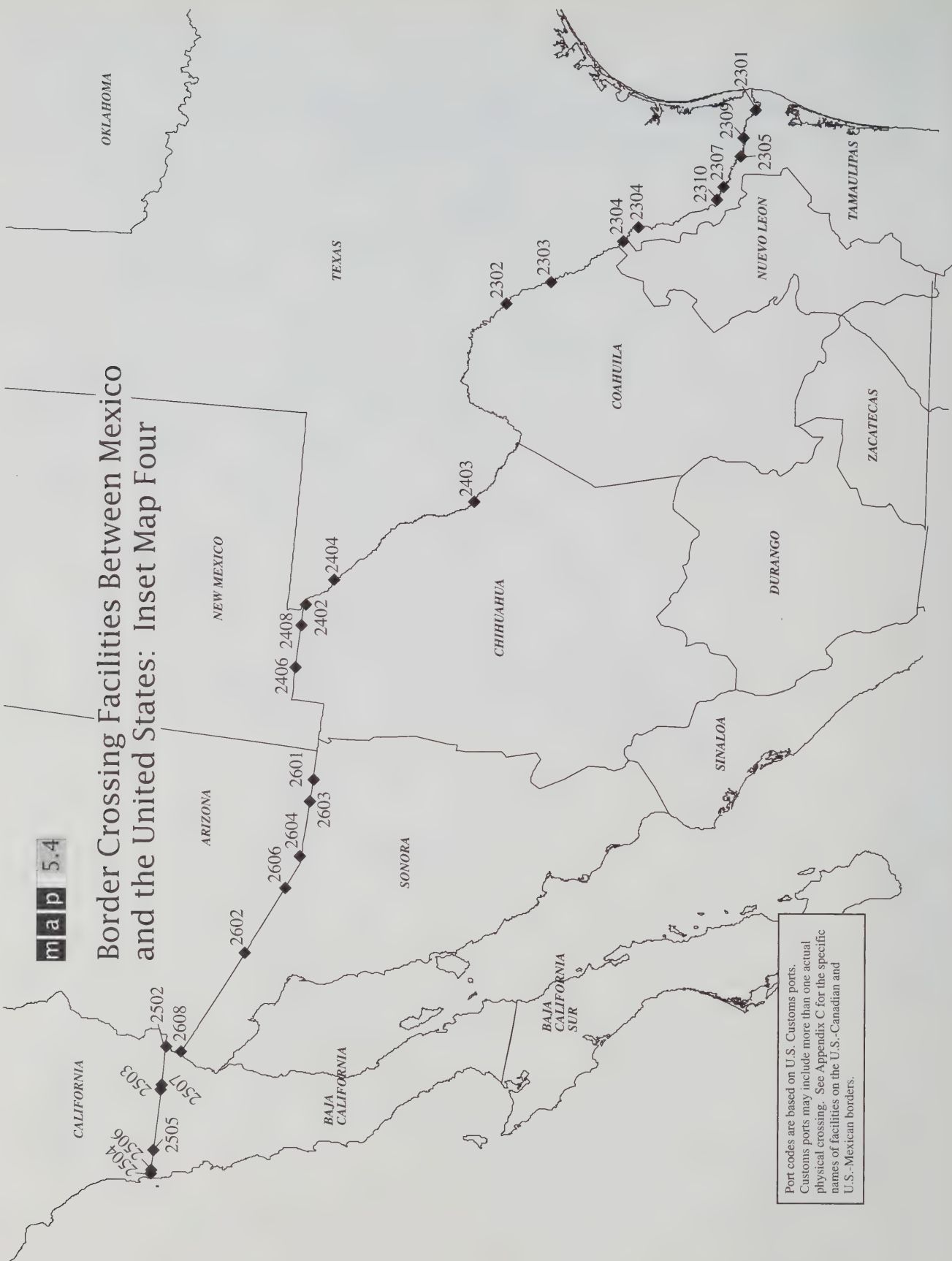
Port codes are based on U.S. Customs ports. Customs ports may include more than one actual physical crossing. See Appendix C for the specific names of facilities on the U.S.-Canadian and U.S.-Mexican borders.





## Border Crossing Facilities Between Canada and the United States: Inset Map Three





# Top Canadian Merchandise Trade Commodities by Mode With Mexico: 1996

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		<b>Road imports</b>	
Vehicles other than railway (87)	172	Electrical machinery, equipment and parts (85)	934
Oil seeds and oleaginous fruits (12)	143	Nuclear reactors, boilers, machinery and parts (84)	589
Nuclear reactors, boilers, machinery and parts (84)	140	Vehicles other than railway (87)	493
Cereals (10)	108	Furniture, lamps and prefabricated buildings (94)	177
Electrical machinery, equipment and parts (85)	70	Edible vegetables and roots (07)	78
<b>Overall imports</b>		<b>Rail exports</b>	
Vehicles other than railway (87)	1,482	Dairy products (04)	34
Electrical machinery, equipment and parts (85)	1,065	Pulp of wood and paperboard (47)	14
Nuclear reactors, boilers, machinery and parts (84)	755	Vehicles other than railway (87)	13
Furniture, lamps and prefabricated buildings (94)	180	Electrical machinery, equipment and parts (85)	11
Mineral fuels, oils and waxes (27)	142	Salt, sulfur, plaster and cement (25)	10
<b>Air exports</b>		<b>Rail imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	60	Vehicles other than railway (87)	986
Electrical machinery, equipment and parts (85)	45	Nuclear reactors, boilers, machinery and parts (84)	111
Measuring and testing Instruments (90)	5	Electrical machinery, equipment and parts (85)	30
Vehicles other than railway (87)	3	Iron and steel (72)	16
Pharmaceutical products (30)	2	Ores, slag and ash (26)	10
<b>Air imports</b>		<b>Water exports</b>	
Electrical machinery, equipment and parts (85)	99	Oil seeds and oleaginous fruits (12)	142
Nuclear reactors, boilers, machinery and parts (84)	55	Cereals (10)	97
Organic chemicals (29)	53	Nuclear reactors, boilers, machinery and parts (84)	27
Measuring and testing instruments (90)	8	Miscellaneous chemical products (38)	25
Not knitted or crocheted apparel (62)	6	Salt, sulfur, plaster and cement (25)	21
<b>Road exports</b>		<b>Water imports</b>	
Vehicles other than railway (87)	156	Mineral fuels, oils and waxes (27)	24
Nuclear reactors, boilers, machinery and parts (84)	51	Beverages, spirits and vinegar (22)	8
Impregnated fabrics (59)	16	Salt, sulfur, plaster and cement (25)	7
Electrical machinery, equipment and parts (85)	13	Iron and steel (72)	3
Rubber and articles (40)	10	Sugars and sugar confectionery (17)	2

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS).

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

# Top Canadian Merchandise Trade Commodities by Mode With the United States: 1996

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		<b>Road imports</b>	
Vehicles other than railway (87)	40,847	Vehicles other than railway (87)	20,034
Mineral fuels, oils and waxes (27)	19,151	Nuclear reactors, boilers, machinery and parts (84)	19,109
Nuclear reactors, boilers, machinery and parts (84)	15,369	Electrical machinery, equipment and parts (85)	9,829
Electrical machinery, equipment and parts (85)	9,274	Plastics (39)	3,854
Wood and Articles (44)	8,970	Special transactions trade (99)	2,484
<b>Overall imports</b>		<b>Rail exports</b>	
Vehicles other than railway (87)	25,835	Vehicles other than railway (87)	17,778
Nuclear reactors, boilers, machinery and parts (84)	22,321	Wood and articles (44)	4,090
Electrical machinery, equipment and parts (85)	13,232	Paper and paperboard (48)	3,145
Plastics (39)	4,670	Pulp of wood and paperboard (47)	1,789
Measuring and testing instruments (90)	3,714	Aluminum and articles (76)	1,290
<b>Air exports</b>		<b>Rail imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	1,973	Vehicles other than railway (87)	5,700
Electrical machinery, equipment and parts (85)	1,481	Plastics (39)	747
Aircraft, spacecraft and parts (88)	1,108	Organic chemicals (29)	622
Special transactions trade (99)	1,047	Nuclear reactors, boilers, machinery and parts (84)	352
Pearls, stones, metals and imitation jewelry (71)	801	Miscellaneous chemical products (38)	249
<b>Air imports</b>		<b>Water exports</b>	
Electrical machinery, equipment and parts (85)	3,248	Mineral fuels, oils and waxes (27)	2,402
Nuclear reactors, boilers, machinery and parts (84)	2,829	Paper and paperboard (48)	740
Measuring and testing instruments (90)	1,246	Organic chemicals (29)	447
Aircraft, spacecraft and parts (88)	1,206	Ores, slag and ash (26)	388
Pharmaceutical Products (30)	424	Salt, sulfur, plaster and cement (25)	207
<b>Road exports</b>		<b>Water imports</b>	
Vehicles other than railway (87)	22,969	Mineral fuels, oils and waxes (27)	856
Nuclear reactors, boilers, machinery and parts (84)	12,289	Ores, slag and ash (26)	285
Electrical machinery, equipment and parts (85)	7,740	Inorganic chemicals (28)	228
Paper and paperboard (48)	4,866	Electrical machinery, equipment and parts (85)	73
Wood and articles (44)	4,691	Cereals (10)	70

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS).

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).



table 6-7a

# Top Mexican Merchandise Trade Commodities by Mode With Canada: 1996

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		<b>Road imports</b>	
Vehicles other than railway (87)	1,056	Nuclear reactors, boilers, machinery and parts (84)	190
Nuclear reactors, boilers, machinery and parts (84)	546	Electrical machinery, equipment and parts (85)	190
Mineral fuels, oils and waxes (27)	138	Plastics (39)	58
Electrical machinery, equipment and parts (85)	127	Measuring and testing instruments (90)	49
Measuring and testing instruments (90)	30	Vehicles other than railway (87)	42
<b>Overall imports</b>		<b>Rail exports</b>	
Nuclear reactors, boilers, machinery and parts (84)	259	Vehicles other than railway (87)	1,029
Electrical machinery, equipments and parts (85)	258	Nuclear reactors, boilers, machinery and parts (84)	200
Oil seeds and oleaginous fruits (12)	170	Beverages, spirits and vinegar (22)	9
Vehicles other than railway (87)	155	Ores, slag and ash (26)	6
Cereals (10)	117	Carpets and other textile floor coverings (57)	5
<b>Air exports</b>		<b>Rail imports</b>	
Nuclear reactors, boiler, machinery and parts (84)	50	Vehicles other than railway (87)	38
Electrical machinery, equipment and parts (85)	23	Dairy products (4)	38
Organic chemicals (29)	5	Pulp of wood and paperboard (47)	23
Not knitted or crocheted apparel (62)	4	Cereals (10)	22
Plastics (39)	3	Edible vegetables and roots (7)	14
<b>Air imports</b>		<b>Water exports</b>	
Electrical machinery, equipment and parts (85)	54	Mineral fuels, oils and waxes (27)	138
Nuclear reactors, boilers, machinery and parts (84)	30	Vehicles other than railway (87)	8
Special classification provisions (98)	19	Salt, sulfur, plaster and cement (25)	9
Measuring and testing instruments (90)	9	Man-made staple fibers (55)	3
Pharmaceutical products (30)	4	Iron and steel (72)	3
<b>Road exports</b>		<b>Water imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	295	Oil seeds and oleaginous fruits (12)	161
Electrical machinery, equipment and parts (85)	95	Cereals (10)	92
Measuring and testing instruments (90)	27	Miscellaneous chemical products (38)	24
Edible fruit and nuts (8)	15	Mineral fuels, oils and waxes (27)	18
Ceramic products (69)	14	Salt, sulfur, plaster and cement (25)	20

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS). Mode of transportation data are preliminary.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**t a b l e** 6-7b

# Top Mexican Merchandise Trade Commodities by Mode With the United States: 1996

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		<b>Road imports</b>	
Electrical machinery, equipment and parts (85)	22,959	Electrical machinery, equipments and parts (85)	15,169
Vehicles other than railway (87)	14,034	Nuclear reactors, boilers, machinery and parts (84)	6,008
Mineral fuels, oils and waxes (27)	8,929	Plastics (39)	4,809
Nuclear reactors, boilers, machinery and parts (84)	8,629	Articles of iron and steel (73)	2,098
Not knitted or crocheted apparel (62)	2,225	Special classification provisions (98)	738
<b>Overall imports</b>		<b>Rail exports</b>	
Electrical machinery, equipment and parts (85)	16,936	Vehicles other than railway (87)	10,598
Nuclear reactors, boilers, machinery and parts (84)	8,683	Nuclear reactors, boilers, machinery and parts (84)	704
Plastics (39)	5,255	Beverages, spirits and vinegar (22)	238
Articles of iron and steel (73)	2,478	Inorganic chemicals (28)	131
Special classification provisions (98)	898	Articles of iron and steel (73)	115
<b>Air exports</b>		<b>Rail imports</b>	
Electrical machinery, equipments and parts (85)	604	Vehicles other than railway (87)	1,050
Nuclear reactors, boilers, machinery and parts (84)	563	Cereals (10)	653
Pearls, stones, metals and imitation jewelry (71)	214	Oil seeds and oleaginous fruits (12)	643
Aircraft, spacecraft and parts (88)	154	Pulp of wood and paperboard (47)	289
Measuring and testing instruments (90)	138	Iron and steel (72)	243
<b>Air imports</b>		<b>Water exports</b>	
Electrical machinery, equipment and parts (85)	790	Mineral fuels, oils and waxes (27)	8,820
Nuclear reactors, boilers, machinery and parts (84)	454	Vehicles other than railway (87)	403
Measuring and testing instruments (90)	245	Organic chemicals (29)	258
Special classification provisions (98)	153	Iron and steel (72)	172
Pharmaceutical products (30)	65	Articles of iron and steel (73)	145
<b>Road exports</b>		<b>Water imports</b>	
Electrical machinery, equipments and parts (85)	22,210	Cereals (10)	1,051
Nuclear reactors, boilers, machinery and parts (84)	7,250	Mineral fuels, oils and waxes (27)	689
Not knitted or crocheted apparel (62)	2,107	Organic chemicals (29)	485
Furniture, lamps and prefabricated buildings (94)	1,562	Oil seeds and oleaginous fruits (12)	272
Edible, vegetables and roots (7)	1,345	Animal or vegetable fats and oils (15)	96

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS). Mode of transportation data are preliminary.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

# Top U.S. Merchandise Trade Commodities by Mode With Canada: 1996

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		<b>Road imports</b>	
Vehicles other than railway (87)	27,205	Vehicles other than railway (87)	23,115
Nuclear reactors, boilers, machinery and parts (84)	26,381	Nuclear reactors, boilers, machinery and parts (84)	12,957
Electrical machinery, equipment and parts (85)	17,840	Electrical machinery, equipment and parts (85)	7,936
Plastics (39)	5,044	Special classification provisions (98)	5,180
Special classification provisions (98)	4,726	Paper and paperboard (48)	4,762
<b>Overall imports</b>		<b>Rail exports</b>	
Vehicles other than railway (87)	41,398	Vehicles other than railway (87)	6,610
Mineral fuels, oils and waxes (27)	16,815	Nuclear reactors, boilers, machinery and parts (84)	1,587
Nuclear reactors, boilers, machinery and parts (84)	14,050	Plastics (39)	1,127
Wood and articles (44)	8,596	Organic chemicals (29)	902
Paper and paperboard (48)	8,491	Electrical machinery, equipment and parts (85)	421
<b>Air exports</b>		<b>Rail imports</b>	
Electrical machinery, equipment and parts (85)	4,618	Vehicles other than railway (87)	18,894
Nuclear reactors, boilers, machinery and parts (84)	3,510	Wood and articles (44)	3,829
Measuring and testing instruments (90)	1,326	Paper and paperboard (48)	3,099
Aircraft, spacecraft and parts (88)	874	Nuclear reactors, boilers, machinery and parts (84)	1,760
Pharmaceutical products (30)	423	Pulp of wood and paperboard (47)	1,711
<b>Air imports</b>		<b>Water exports</b>	
Nuclear reactors, boilers, machinery and parts (84)	1,863	Mineral fuels, oils and waxes (27)	941
Electrical machinery, equipment and parts (85)	1,301	Ores, slag and ash (26)	298
Special classification provisions (98)	1,147	Inorganic chemicals (28)	251
Pearls, stones, metals and imitation jewelry (71)	782	Electrical machinery, equipment and parts (85)	90
Aircraft, spacecraft and parts (88)	514	Nuclear reactors, boilers, machinery and parts (84)	73
<b>Road exports</b>		<b>Water imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	22,043	Mineral fuels, oils and waxes (27)	2,046
Vehicles other than railway (87)	20,610	Paper and paperboard (48)	742
Electrical machinery, equipment and parts (85)	12,564	Organic chemicals (29)	461
Plastics (39)	3,996	Ores, slag and ash (26)	378
Special classification provisions (98)	3,594	Salt, sulfur, plaster and cement (25)	276

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS).

## SOURCES

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1996*. (Washington, DC: 1998).

Road and rail: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).



# Top U.S. Merchandise Trade Commodities by Mode With Mexico: 1996

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		<b>Road imports</b>	
Electrical machinery, equipment and parts (85)	13,536	Electrical machinery, equipment and parts (85)	17,796
Nuclear reactors, boilers, machinery and parts (84)	7,416	Nuclear reactors, boilers, machinery and parts (84)	6,288
Vehicles other than railway (87)	5,501	Vehicles other than railway (87)	2,794
Plastics (39)	3,551	Not knitted or crocheted apparel (62)	2,175
Special classification provisions (98)	2,221	Special classification provisions (98)	1,969
<b>Overall imports</b>		<b>Rail exports</b>	
Electrical machinery, equipment and parts (85)	18,702	Vehicles other than railway (87)	1,671
Vehicles other than railway (87)	14,046	Cereals (10)	503
Nuclear reactors, boilers, machinery and parts (84)	7,855	Oil seeds and oleaginous fruits (12)	396
Mineral fuels, oils and waxes (27)	6,798	Nuclear reactors, boilers, machinery and parts (84)	216
Measuring and testing instruments (90)	2,343	Pulp of wood and paperboard (47)	211
<b>Air exports</b>		<b>Rail imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	848	Vehicles other than railway (87)	10,408
Electrical machinery, equipment and parts (85)	744	Nuclear reactors, boilers, machinery and parts (84)	652
Measuring and testing instruments (90)	246	Beverages, spirits and vinegar (22)	247
Pharmaceutical products (30)	56	Inorganic chemicals (28)	132
Aircraft, spacecraft and parts (88)	52	Copper and articles (74)	121
<b>Air imports</b>		<b>Water exports</b>	
Electrical machinery, equipment and parts (85)	621	Cereals (10)	1,023
Nuclear reactors, boilers, machinery and parts (84)	401	Mineral fuels, oils and waxes (27)	728
Special classification provisions (98)	239	Organic chemicals (29)	436
Pearls, stones, metals and imitation jewelry (71)	127	Oil seeds and oleaginous fruits (12)	278
Measuring and testing instruments (90)	116	Nuclear reactors, boilers, machinery and parts (84)	102
<b>Road exports</b>		<b>Water imports</b>	
Electrical machinery, equipment and parts (85)	12,644	Mineral fuels, oils and waxes (27)	6,692
Nuclear reactors, boilers, machinery and parts (84)	6,260	Vehicles other than railway (87)	806
Vehicles other than railway (87)	3,879	Iron and steel (72)	405
Plastics (39)	3,416	Organic chemicals (29)	194
Articles of iron and steel (73)	1,568	Salt, sulfur, plaster and cement (25)	108

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS).

## SOURCES

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1996*. (Washington, DC: 1998).

Road and rail: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).



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s e c t i o n

7

International  
Merchandise Trade  
Between North  
America and the  
Rest of the World



table 7-1

# International Merchandise Trade Between North America and the Rest of the World by Value

(Current value in millions of U.S. dollars)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total trade</b>	<b>71,471</b>	<b>89,540</b>	<b>88,699</b>	<b>U</b>	<b>28,493</b>	<b>33,577</b>	<b>655,349</b>	<b>947,377</b>	<b>1,005,328</b>
Exports	31,515	38,880	37,667	U	11,244	13,289	281,634	410,695	443,482
Imports	39,956	50,660	51,032	U	17,249	20,288	373,715	536,682	561,846
<b>Air, total trade</b>	<b>8,986</b>	<b>16,381</b>	<b>17,436</b>	<b>U</b>	<b>4,095</b>	<b>5,455</b>	<b>190,495</b>	<b>335,102</b>	<b>358,960</b>
Exports	5,188	5,984	6,438	U	1,386	1,674	103,057	168,384	181,279
Imports	3,798	10,397	10,998	U	2,710	3,781	87,437	166,718	177,682
<b>Water, total trade</b>	<b>43,356</b>	<b>56,214</b>	<b>54,081</b>	<b>U</b>	<b>13,919</b>	<b>17,157</b>	<b>415,972</b>	<b>556,041</b>	<b>572,196</b>
Exports	24,429	29,098	27,749	U	7,524	9,463	147,361	211,825	216,042
Imports	18,926	27,116	26,332	U	6,395	7,694	268,611	344,216	356,154
<b>Road, total trade</b>	<b>9,316</b>	<b>14,806</b>	<b>14,832</b>	<b>U</b>	<b>7,637</b>	<b>8,315</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	1,802	3,436	3,163	U	1,883	1,832	U	U	U
Imports	7,514	11,370	11,669	U	5,753	6,483	U	U	U
<b>Rail, total trade</b>	<b>2,375</b>	<b>1,171</b>	<b>1,005</b>	<b>U</b>	<b>680</b>	<b>685</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	93	361	316	U	257	216	U	U	U
Imports	2,281	809	689	U	423	469	U	U	U
<b>Pipeline, total trade</b>	<b>7,438</b>	<b>968</b>	<b>1,344</b>	<b>U</b>	<b>NS</b>	<b>NS</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	3	NS	NS	U	NS	NS	U	U	U
Imports	7,435	968	1,344	U	NS	NS	U	U	U
<b>Other, total trade</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>U</b>	<b>2,162</b>	<b>1,965</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	N	N	N	U	194	104	U	U	U
Imports	N	N	N	U	1,968	1,861	U	U	U

**KEY:** N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

## NOTES

### All Countries

Intra-North American trade is excluded from these figures (e.g., Canada's trade with Mexico and the United States is excluded; Mexico's trade with Canada and the United States is excluded, and the United State's trade with Mexico and Canada is excluded).

### Canada

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

Pipeline: Data represent mostly pipeline moves. However, the pipeline total shown here also includes mail, parcel post and other miscellaneous modes of transportation.

### United States

Total: Includes air and water shipments only.

Road, rail and pipeline: Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Table 6-3.

# International Merchandise Trade Between North America and the Rest of the World by Value—Continued

## SOURCES

### Canada

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

### United States

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).



table 7-2

# International Merchandise Trade Between North America and the Rest of the World by Weight

(Millions of metric tons)

	Canada			Mexico			United States		
	1990 <sup>e</sup>	1995 <sup>e</sup>	1996 <sup>e</sup>	1990	1995	1996	1990	1995	1996
<b>Total trade</b>	<b>239.0</b>	<b>218.7</b>	<b>235.7</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>753.9</b>	<b>827.0</b>	<b>822.0</b>
Exports	179.5	153.9	171.2	U	U	U	339.4	368.7	348.7
Imports	59.5	64.7	64.6	U	U	U	414.5	458.3	473.3
<b>Air, total trade</b>	<b>0.7</b>	<b>1.8</b>	<b>1.1</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>2.9</b>	<b>4.3</b>	<b>4.6</b>
Exports	0.2	0.5	0.3	U	U	U	1.3	2.0	2.2
Imports	0.5	1.3	0.8	U	U	U	1.6	2.3	2.4
<b>Water, total trade</b>	<b>219.7</b>	<b>202.4</b>	<b>220.2</b>	<b>U</b>	<b>U</b>	<b>40.6</b>	<b>751.0</b>	<b>822.7</b>	<b>817.4</b>
Exports	177.9	151.4	169.1	U	U	31.3	338.1	366.7	346.5
Imports	41.8	51.1	51.1	U	U	9.3	412.9	456.0	470.9
<b>Road, total trade</b>	<b>5.0</b>	<b>6.2</b>	<b>4.5</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	1.2	1.8	1.5	U	U	U	U	U	U
Imports	3.8	4.3	3.0	U	U	U	U	U	U
<b>Rail, total trade</b>	<b>1.2</b>	<b>0.8</b>	<b>0.6</b>	<b>U</b>	<b>0.2</b>	<b>0.4</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	0.2	0.3	0.2	U	0.2	0.4	U	U	U
Imports	1.0	0.5	0.4	U	NS	NS	U	U	U
<b>Pipeline and other, total trade</b>	<b>12.4</b>	<b>7.5</b>	<b>9.2</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	0.0	NS	NS	N	N	N	U	U	U
Imports	12.4	7.5	9.2	N	N	N	U	U	U

**KEY:** e = Data are estimated. N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

## NOTES

### All Countries

Intra-North American trade is excluded from these figures (e.g., Canada's trade with Mexico and the United States is excluded; Mexico's trade with Canada and the United States is excluded, and the United State's trade with Mexico and Canada is excluded).

### Canada

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

### Mexico

Total, air and road: Data were not available that excluded trade with Canada and the United States. See Appendix B for available data for Mexican air and road trade with all countries.

Rail: Represents trade with Central American countries. Data were unavailable for 1990 that excluded trade with Canada and the United States. See Appendix B for Mexican rail trade with all countries.

Water: Data were unavailable for 1990 and 1995 that excluded trade with Canada and the United States. See Appendix B for Mexican water trade with all countries.

### United States

Total: Includes only air and water shipments.

Road, rail and pipeline: Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Table 6-6.

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**table 7-2****International Merchandise Trade Between North America  
and the Rest of the World by Weight—Continued****SOURCES****Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1989-1995*. (Mexico City, D.F.: 1996).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1997*. (Querétaro, Qro.: 1998).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

**United States**

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

**t a b l e** 7-3a

# Top Canadian International Merchandise Trade Gateways by Mode: 1996

(Excluding Trade With the United States and Mexico)

(Current value in millions of U.S. dollars)

Port name	Exports	Imports	Total international (non-North American) trade, 1996
<b>Air</b>			
Toronto-Pearson Int. Air, Ont.	2,940	5,443	8,383
Montréal-Mirabel Int. Air, Que.	1,241	2,289	3,529
Ottawa, Ont.	591	1,384	1,975
Montréal-Dorval Int. Air, Que.	750	394	1,143
Vancouver-Int. Airport, B.C.	451	600	1,051
Calgary, Alta.	304	371	674
Hamilton, Ont.	62	365	427
Granby, Que.	0	248	248
Edmonton, Alta.	47	109	156
Winnipeg, Man.	103	1	104
<b>Water Transport</b>			
Vancouver-Marine and Rail, B.C.	12,369	NS	12,369
Montréal-Main Long Room, Que.	4,378	5,695	10,073
Toronto-Main Long Room, Ont.	69	6,014	6,083
Halifax, N.S.	2,419	2,194	4,614
Vancouver-Main Long Room, B.C.	0	4,353	4,353
Nanaimo, B.C.	2,228	1	2,229
Saint John, N.B.	662	1,545	2,207
Québec, Que.	551	1,199	1,751
Sept-Îles, Que.	892	120	1,012
Brampton, Ont.	0	887	887
<b>Road</b>			
Windsor-Ambassador Bridge, Ont.	249	2,274	2,523
Lacolle, Que.	1,287	842	2,129
Fort Erie, Ont.	520	1,225	1,745
Niagara Falls, Ont.	633	971	1,604
Phillipsburg, Que.	0	973	973
Pacific Highway, B.C.	75	797	872
Toronto-Q'way Truck Term, Ont.	0	524	524
Sarnia, Ont.	81	439	520
Lansdowne, Ont.	113	200	313
Coutts, Alta.	29	169	198
<b>Rail</b>			
Fort Erie, Ont.	138	112	250
Toronto-Main Long Room, Ont.	0	236	236
Montréal-Main Long Room, Que.	0	81	81
Sarnia, Ont.	51	10	61
Windsor-Ambassador Bridge, Ont.	48	1	49
Lacolle, Que.	31	11	43
Winnipeg, Man.	0	35	35
Welland, Ont.	0	34	34
Niagara Falls, Ont.	29	2	31
Waneta, B.C.	0	21	21

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**t a b l e 7-3a****Top Canadian International Merchandise Trade Gateways  
by Mode: 1996**  
(Excluding Trade With the United States and Mexico)—*Continued***NOTES**

Merchandise trade with the United States and Mexico is excluded from this data.

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).



# Top U.S. International Merchandise Trade Gateways by Mode: 1996 (Excluding Trade With the Canada and Mexico)

(Current value in millions of U.S. dollars)

Port name	Exports	Imports	Total international (non-North American) trade, 1996
<b>Air</b>			
John F. Kennedy International Airport, NY	38,034	41,749	79,783
San Francisco International Airport, CA	33,402	37,002	70,404
Los Angeles International Airport, CA	31,850	28,610	60,460
Chicago, IL	17,693	14,858	32,551
Miami International Airport, FL	12,122	6,163	18,284
Anchorage, AK	3,302	10,027	13,329
Atlanta, GA	3,925	4,236	8,160
New Orleans, LA	3,702	4,120	7,823
Dallas/Fort Worth, TX	3,122	3,513	6,635
Boston Logan Airport, MA	3,747	2,691	6,438
<b>Water Transport</b>			
Port of Los Angeles, CA	19,954	60,842	80,795
Port of Long Beach, CA	14,596	55,226	69,821
Port of New York, NY and NJ	19,907	44,411	64,319
Port of Houston, TX	18,984	14,510	33,493
Port of Seattle, WA	9,842	21,405	31,246
Port of Oakland, CA	10,783	15,840	26,623
Port of Norfolk, VA	13,471	10,847	24,318
Port of Charleston, SC	10,398	13,418	23,816
Port of Baltimore, MD	7,826	11,302	19,128
Port of New Orleans, LA	9,535	8,597	18,132
<b>Road</b>			
U	U	U	U
<b>Rail</b>			
U	U	U	U

**KEY:** U = Data are unavailable.

## NOTES

Merchandise trade with Canada and Mexico is excluded from this data.

Air: Values for some airports may include a low (generally less than 2-3 percent of the total value) level of small user-fee airports located in the same regional area. In addition, due to confidentiality regulations, data for nearby individual courier operations are included in certain airport totals.

Road, rail and pipeline: Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Table 6-7c.

## SOURCES

Air: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. Transportation Branch. Special tabulation. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

**table 7-4a**

# Top Canadian International Trade Commodities by Value: 1996

(Excluding Trade With the United States and Mexico)

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		<b>Land exports (road only)</b>	
Cereals (10)	3,599	Electrical machinery, equipment and parts (85)	538
Nuclear reactors, boilers, machinery and parts (84)	3,109	Nuclear reactors, boilers, machinery and parts (84)	516
Wood and articles (44)	3,058	Vehicles other than railway (87)	458
Pulp of wood and paperboard (47)	2,820	Ores, slag and ash (26)	114
Electrical machinery, equipment and parts (85)	2,186	Paper and paperboard (48)	106
<b>Overall imports</b>		<b>Land imports (road only)</b>	
Nuclear reactors, boilers, machinery and parts (84)	9,009	Nuclear reactors, boilers, machinery and parts (84)	3,160
Electrical machinery, equipment and parts (85)	7,415	Electrical machinery, equipment and parts (85)	2,559
Mineral fuels, oils and waxes (27)	5,464	Special classification provisions (98)	1,263
Vehicles other than railway (87)	3,307	Vehicles other than railway (87)	584
Special classification provisions (98)	1,873	Edible fruits and nuts (08)	375
<b>Air exports</b>		<b>Water exports</b>	
Nuclear reactors, boilers, machinery and parts (84)	1,597	Cereals (10)	3,588
Electrical machinery, equipment and parts (85)	1,365	Wood and articles (44)	3,029
Aircraft, spacecraft and parts (88)	1,040	Pulp of wood and paperboard (47)	2,795
Pearls, stones, metals and imitation jewelry (71)	817	Paper and paperboard (48)	2,049
Measuring and testing instruments (90)	423	Mineral fuels, oils and waxes (27)	2,036
<b>Air imports</b>		<b>Water imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	3,009	Mineral fuels, oils and waxes (27)	4,192
Electrical machinery, equipment and parts (85)	2,500	Nuclear reactors, boilers, machinery and parts (84)	3,235
Measuring and testing instruments (90)	723	Vehicles other than railway (87)	2,597
Aircraft, spacecraft and parts (88)	709	Electrical machinery, equipment and parts (85)	1,743
Organic chemicals (29)	567	Iron and steel (72)	962

## NOTES

Merchandise trade with the United States and Mexico is excluded from this data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

table 7-4b

# Top Mexican International Trade Commodities by Value: 1996

(Excluding Trade With the United States and Canada)

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		<b>Rail imports</b>	
Locomotives and traffic signals (86)	1,651	Nuclear reactors, boilers, machinery and parts (84)	142
Photographic goods (37)	1,243	Electrical machinery, equipments and parts (85)	100
Nuclear reactors, boilers, machinery and parts (84)	753	Toys, games and sport equipment (95)	24
Furniture, lamps and prefabricated buildings (94)	655	Dairy products (4)	17
Malts, starches and inulin (11)	528	Wool and animal hair (51)	16
<b>Overall imports</b>		<b>Road exports</b>	
Electrical machinery, equipments and parts (85)	2,636	Nuclear reactors, boilers, machinery and parts (84)	255
Nuclear reactors, boilers, machinery and parts (84)	2,182	Electrical machinery, equipments and parts (85)	159
Special classification provisions (98)	971	Vehicles other than railway (87)	108
Organic chemicals (29)	821	Toys, games and sport equipment (95)	89
Pharmaceutical products (30)	260	Iron and steel (72)	65
<b>Air exports</b>		<b>Road imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	611	Electrical machinery, equipments and parts (85)	2,057
Electrical machinery, equipments and parts (85)	270	Nuclear reactors, boilers, machinery and parts (84)	1,037
Pharmaceutical products (30)	201	Special classification provisions (98)	679
Organic chemical (29)	105	Measuring and testing instruments (90)	248
Pearls, stones, metals and imitation jewelry (71)	95	Iron and steel (72)	141
<b>Air imports</b>		<b>Water exports</b>	
Electrical machinery, equipments and parts (85)	906	Mineral fuels, oils and waxes (27)	2,281
Nuclear reactors, boilers, machinery and parts (84)	692	Vehicles other than railway (87)	1,061
Organic chemicals (29)	553	Iron and steel (72)	651
Special classification provisions (98)	393	Nuclear reactors, boilers, machinery and parts (84)	340
Pharmaceutical products (30)	260	Articles of iron and steel (73)	267
<b>Rail exports</b>		<b>Water imports</b>	
Iron and steel (72)	35	Nuclear reactors, boilers, machinery and parts (84)	1,384
Coffee, tea and spices (9)	31	Iron and steel (72)	526
Inorganic chemicals (28)	30	Organic chemicals (29)	397
Salt, sulfur, plaster and cement (25)	16	Electrical machinery, equipments and parts (85)	215
Mineral fuels, oils and waxes (27)	15	Dairy products (4)	175

**NOTE:** Commodity description based on the two-digit Harmonized Commodity Description and Coding System (HS). Mode of transportation data are preliminary.

**SOURCE:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).



**table 7-4c**

# Top U.S. International Trade Commodities by Value: 1996 (Excluding Trade With Canada and Mexico)

(Current value in millions of U.S. dollars)

	1996		1996
<b>Overall exports</b>		Pearls, stones, metals and imitation jewelry (71)	13,498
Nuclear reactors, boilers, machinery and parts (84)	88,937	Measuring and testing instruments (90)	10,875
Electrical machinery, equipment and parts (85)	65,934	Special classification provisions (98)	8,808
Aircraft, spacecraft and parts (88)	30,756	<b>Land exports</b>	
Measuring and testing instruments (90)	24,701	U	U
Vehicles other than railway (87)	22,847	<b>Land imports</b>	
<b>Overall imports</b>		U	U
Nuclear reactors, boilers, machinery and parts (84)	108,192	<b>Water exports</b>	
Electrical machinery, equipment and parts (85)	87,511	Nuclear reactors, boilers, machinery and parts (84)	30,649
Vehicles other than railway (87)	50,075	Vehicles other than railway (87)	20,164
Mineral fuels, oils and waxes (27)	49,524	Cereals (10)	14,817
Measuring and testing instruments (90)	20,087	Organic chemicals (29)	10,531
<b>Air exports</b>		Electrical machinery, equipment and parts (85)	9,897
Nuclear reactors, boilers, machinery and parts (84)	56,197	<b>Water imports</b>	
Electrical machinery, equipment and parts (85)	55,295	Nuclear reactors, boilers, machinery and parts (84)	53,221
Measuring and testing instruments (90)	21,080	Vehicles other than railway (87)	48,267
Aircraft, spacecraft and parts (88)	10,273	Mineral fuels, oils and waxes (27)	45,206
Pearls, stones, metals and imitation jewelry (71)	9,973	Electrical machinery, equipment and parts (85)	34,767
<b>Air imports</b>		Not knitted or crocheted apparel (62)	13,847
Electrical machinery, equipment and parts (85)	50,501		
Nuclear reactors, boilers, machinery and parts (84)	50,491		

**KEY:** U = Data are unavailable.

## NOTES

Merchandise trade with Canada and Mexico is excluded from this data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

Total: Includes air and water shipments, excluding trade with Canada and Mexico.

Land (road and rail): Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico. Data for these modes are therefore shown in Tables 6-12a and 6-12b.

**SOURCE:** Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).



**t a b l e 7-5a**

# Top Canadian International Trade Commodities by Weight: 1996

(Excluding Trade With the United States and Mexico)

(Thousands of metric tons)

	1996		1996
<b>Overall exports</b>		<b>Land exports (road only)</b>	
Special transactions-trade (99)	60,761	Ores, slag and ash (26)	299
Mineral fuels, oils and waxes (27)	34,757	Paper and paperboard (48)	155
Ores, slag and ash (26)	19,603	Edible vegetables and roots (07)	101
Cereals (10)	18,036	Vehicles other than railway (87)	91
Pulp of wood and paperboard (47)	6,146	Other made up textile articles (63)	69
<b>Overall imports</b>		<b>Land imports (road only)</b>	
Mineral fuels, oils and waxes (27)	38,355	Edible fruit and nuts (08)	587
Special transactions-trade (99)	4,074	Nuclear reactors, boilers, machinery and parts (84)	336
Ores, slag and ash (26)	3,477	Special classification provisions (98)	258
Inorganic chemicals (28)	2,944	Iron and steel (72)	232
Iron and steel (72)	2,533	Toys, games and sporting equipment (95)	206
<b>Air exports</b>		<b>Water exports</b>	
Iron and steel (72)	62	Special transactions-trade (99)	60,644
Special transactions-trade (99)	58	Mineral fuels, oils and waxes (27)	34,749
Nuclear reactors, boilers, machinery and parts (84)	36	Ores, slag and ash (26)	19,303
Electrical machinery, equipment and parts (85)	32	Cereals (10)	18,007
Fish and crustaceans (03)	14	Pulp of wood and paperboard (47)	6,087
<b>Air imports</b>		<b>Water imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	113	Mineral fuels, oils and waxes (27)	29,044
Special classification provisions (98)	106	Special transaction-trade (99)	4,003
Live trees and plants (06)	103	Ores, slag and ash (26)	3,284
Electrical machinery, equipment and parts (85)	84	Inorganic chemicals (28)	2,920
Ores, slag and ash (26)	54	Iron and steel (72)	2,297

## NOTES

Merchandise trade with the United States and Mexico is excluded from these data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

All land modes: Canada export data for all land modes represent transshipments (e.g. trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

# Top U.S. International Trade Commodities by Weight: 1996 (Excluding Trade With the Canada and Mexico)

(Thousands of metric tons)

	1996		1996
<b>Overall exports</b>		Electrical machinery, equipment and parts (85)	314
Mineral fuels, oils and waxes (27)	114	Not knitted or crocheted apparel (62)	199
Cereals (10)	81	Live trees and plants (6)	182
Oil seeds and oleaginous fruits (12)	25	Knitted or crocheted apparel (61)	142
Wood and articles (44)	21		
Food residues and waste (23)	14	<b>Land exports</b>	
		U	U
<b>Overall imports</b>		<b>Land imports</b>	
Mineral fuels, oils and waxes (27)	320	U	U
Iron and steel (72)	23		
Ores, slag and ash (26)	23		
Salt, sulfur, plaster and cement (25)	20	<b>Water exports</b>	
Inorganic chemicals (28)	9	Mineral fuels, oils and waxes (27)	113,562
		Cereals (10)	80,604
<b>Air exports</b>		Oil seeds and oleaginous fruits (12)	25,232
Nuclear reactors, boilers, machinery and parts (84)	497	Wood and articles (44)	21,407
Electrical machinery, equipment and parts (85)	331	Food residues and waste (23)	14,106
Measuring and testing instruments (90)	127		
Vehicles other than railway (87)	80	<b>Water imports</b>	
Plastics (39)	75	Mineral fuels, oils and waxes (27)	320,343
		Iron and steel (72)	23,433
<b>Air imports</b>		Ores, slag and ash (26)	22,606
Nuclear reactors, boilers, machinery and parts (84)	435	Salt, sulfur, plaster and cement (25)	20,098
		Inorganic chemicals (28)	9,254

KEY: U = Data are unavailable.

## NOTES

Merchandise trade with Canada and Mexico is excluded from these data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

Total: Includes air and water shipments, excluding trade with Canada and Mexico.

Land (road and rail): Data for these modes are included in U.S. trade with Canada and U.S. trade with Mexico for 1996.

**SOURCE:** Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996.* (Washington, DC: 1998).

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section 8

# Domestic Passenger Travel





## Domestic Passenger Travel by Mode

(Billions (or thousand millions) of passenger-kilometers)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Passenger-km, total</b>	<b>N</b>	<b><sup>e</sup>523</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>5,702</b>	<b>6,647</b>	<b>6,843</b>
<b>Air</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>10</b>	<b>14</b>	<b><sup>e</sup>13</b>	<b>578</b>	<b>667</b>	<b>716</b>
Air carriers	<sup>r</sup> 25	<sup>r</sup> 25	<sup>r</sup> 27	10	14	<sup>e</sup> 13	557	650	700
<b>Road</b>	<b>N</b>	<b><sup>e</sup>497</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>5,084</b>	<b>5,938</b>	<b>6,082</b>
Personal vehicles	N	<sup>e</sup> 466	N	N	N	N	4,888	5,720	5,860
Passenger cars	N	<sup>e</sup> 368	N	N	N	N	3,426	3,681	3,756
Motorcycles	N	<sup>e</sup> 1	N	N	N	N	19	18	18
Light trucks	N	<sup>e</sup> 97	N	N	N	N	1,442	2,021	2,086
Bus	N	<sup>e</sup> 31	N	N	N	N	195	219	223
Charter	N	<sup>e</sup> 3	N	N	N	N	N	N	N
Intercity	N	<sup>e</sup> 3	N	<sup>e</sup> 272	<sup>e</sup> 383	<sup>e</sup> 391	N	N	N
Local motor	N	<sup>e</sup> 13	N	N	N	N	34	30	<sup>p</sup> 30
School	N	<sup>e</sup> 13	N	N	N	N	N	N	N
<b>Rail</b>									
Intercity passenger	1	2	2	5	2	2	10	9	8
<b>Transit</b>	<b>N</b>	<b><sup>a</sup></b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>66</b>	<b>64</b>	<b><sup>p</sup>66</b>
Transit rail	N	N	N	N	N	N	31	32	<sup>p</sup> 34
<b>Water transport</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>N</b>	<b>N</b>	<b>N</b>

<sup>a</sup>Canadian data for all transit services for 1995 are included in the estimate for local motor bus, under road. The transit rail portion of transit services cannot be broken out.

**KEY:** e = Data are estimated. N = Data are nonexistent. p = Data are preliminary. r = Data are revised.

**NOTES****All Countries**

**Air:** The U.S. total for air represents both air carriers and general aviation. However, only the large certificated air carriers are included. See Appendix B for a more complete explanation. The Mexican air total represents only scheduled air carriers. However, nonscheduled and general aviation represents a very small share of passenger travel in Mexico. Canadian data for total air activity are nonexistent because data for general aviation are not collected.

**Road:** Data do not include passenger travel by commercial freight vehicles.

**Transit and water transport:** For the United States, ferry activity is included in the total for transit. For Mexico, data for overall transit activity are nonexistent because the data are not collected. However, Mexican data for water transport do represent ferry activity. Canadian data for transit overall and ferry activity are nonexistent because the data are not collected.

**Canada**

**Air carriers:** Includes Level I to III Canadian air carriers. For a definition of these, see Appendix B.

**Mexico**

**Air:** Data for general aviation are not included in the air total.

**Intercity bus:** Data refer to intercity buses utilizing Mexico's federal highway system.

**United States**

**Passenger-kilometers, total:** Is not the sum of the subcategories because local motor bus is included in both the road and transit totals. This double counting has been removed from the overall total.

## Domestic Passenger Travel by Mode—Continued

## SOURCES

## Canada

Air carriers: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Road: Transport Canada. Ministry of Public Works and Government Services. *Transportation in Canada 1997 - Annual Report*. (Ottawa, Ont.: 1998).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

## Mexico:

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1997).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

## United States

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: 1986-1997).

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. Web site: [www.bts.gov](http://www.bts.gov)

Road: U.S. Department of Transportation. Federal Highway Administration. Highway Statistics, *Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

American Public Transit Association (APTA). *Transit Fact Book*. (Washington, DC: various years).

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

**t a b l e 8-2a**

# Top Canadian Domestic Passenger Metropolitan Area Pairs by Mode: 1996

(Thousands of passengers)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>	<b>12,688</b>	<b>Road</b>	<b>22,376</b>
Montréal, Que. and Toronto, Ont.	1,257	Montréal, Que. and Québec, Que.	2,375
Toronto, Ont. and Vancouver, B.C.	822	Montréal, Que. and Ottawa-Hull, Ont. and Que.	1,835
Ottawa, Ont. and Toronto, Ont.	666	Toronto, Ont. and St. Catherines, Ont.	1,727
Calgary, Alta. and Vancouver, B.C.	578	Kitchener, Ont. and Toronto, Ont.	1,537
Calgary, Alta. and Toronto, Ont.	463	Toronto, Ont. and London, Ont.	1,185
<b>Intercity rail</b>	<b>384</b>	<b>Water</b>	<b>163</b>
Toronto, Ont. and Montréal, Que.	106	Vancouver, B.C. and Victoria, B.C.	141
Toronto, Ont. and Ottawa-Hull, Ont. and Que.	71	Vancouver, B.C. and Vancouver, B.C.	12
London, Ont. and Toronto, Ont.	41		
Montréal, Que. and Ottawa-Hull, Ont. and Que.	35		
Québec, Que. and Montréal, Que.	26		

**NOTE:** Water data for additional Census metropolitan regions for the water mode have not been included due to the high coefficient of variation (CV) ratings, from the low number of observations.

## SOURCES

Air: Statistics Canada. *Air Passenger Origin and Destination, Domestic Report - 1996, Catalogue No. 51-204-XPB*. (Ottawa, Ont.: 1997).

All other modes: Statistics Canada. *Micro Data Files relating to the Canadian Travel Survey (CTS) - 1996, Catalogue No. 87MOO6XCB*. (Ottawa, Ont.: 1998).

**t a b l e 8-2b**

# Top Mexican Domestic Passenger Metropolitan Area Pairs by Mode: 1996

(Thousands of passengers)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	<b>N</b>
Mexico City, D.F. and Monterrey, N.L.	1,287	<b>Water</b>	
Mexico City, D.F. and Guadalajara, Jal.	1,080	Isla Mujeres, Q. Roo and Punta Sam, Q. Roo	79
Mexico City, D.F. and Cancún, Q. Roo	850	Mazatlán, Sin. and La Paz, B.C.S.	78
Mexico City, D.F. and Tijuana, B.C.	650	La Paz, B.C.S. and Topolobampo, Sin.	63
Mexico City, D.F. and Acapulco, Gro.	610	Guaymas, Son. and Santa Rosalía, B.C.S.	24
<b>Intercity rail</b>	<b>N</b>	Puerto Morelos, Q. Roo and Cozumel, Q. Roo	17

**KEY:** N = Data are nonexistent.

**NOTE:** Water data represent port pairs rather than metropolitan area pairs and are based on ferry traffic. See Appendix B for rail and road data.

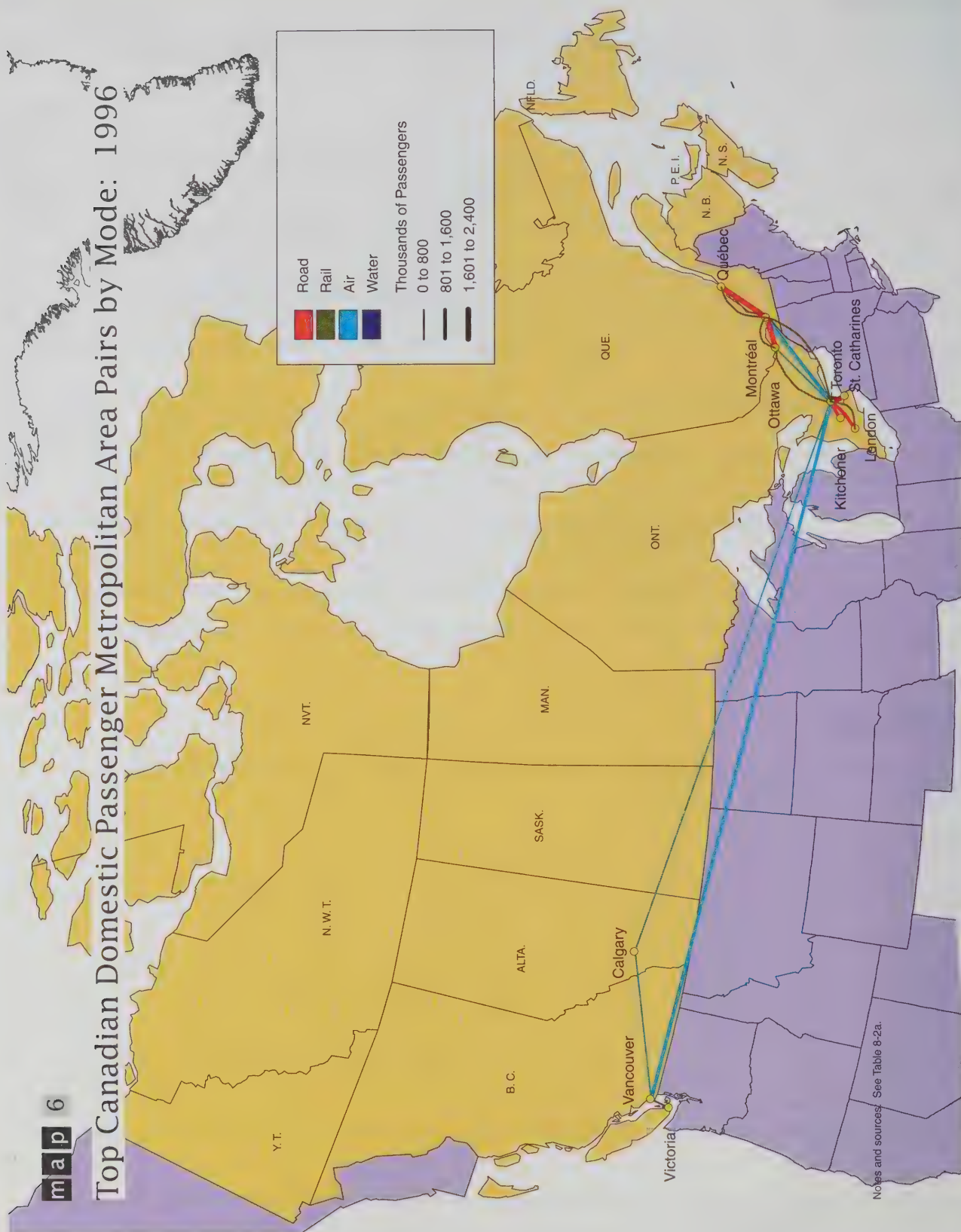
## SOURCES

Air: Instituto Mexicano del Transporte based on data from Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Querétaro, Gro.: 1998).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).



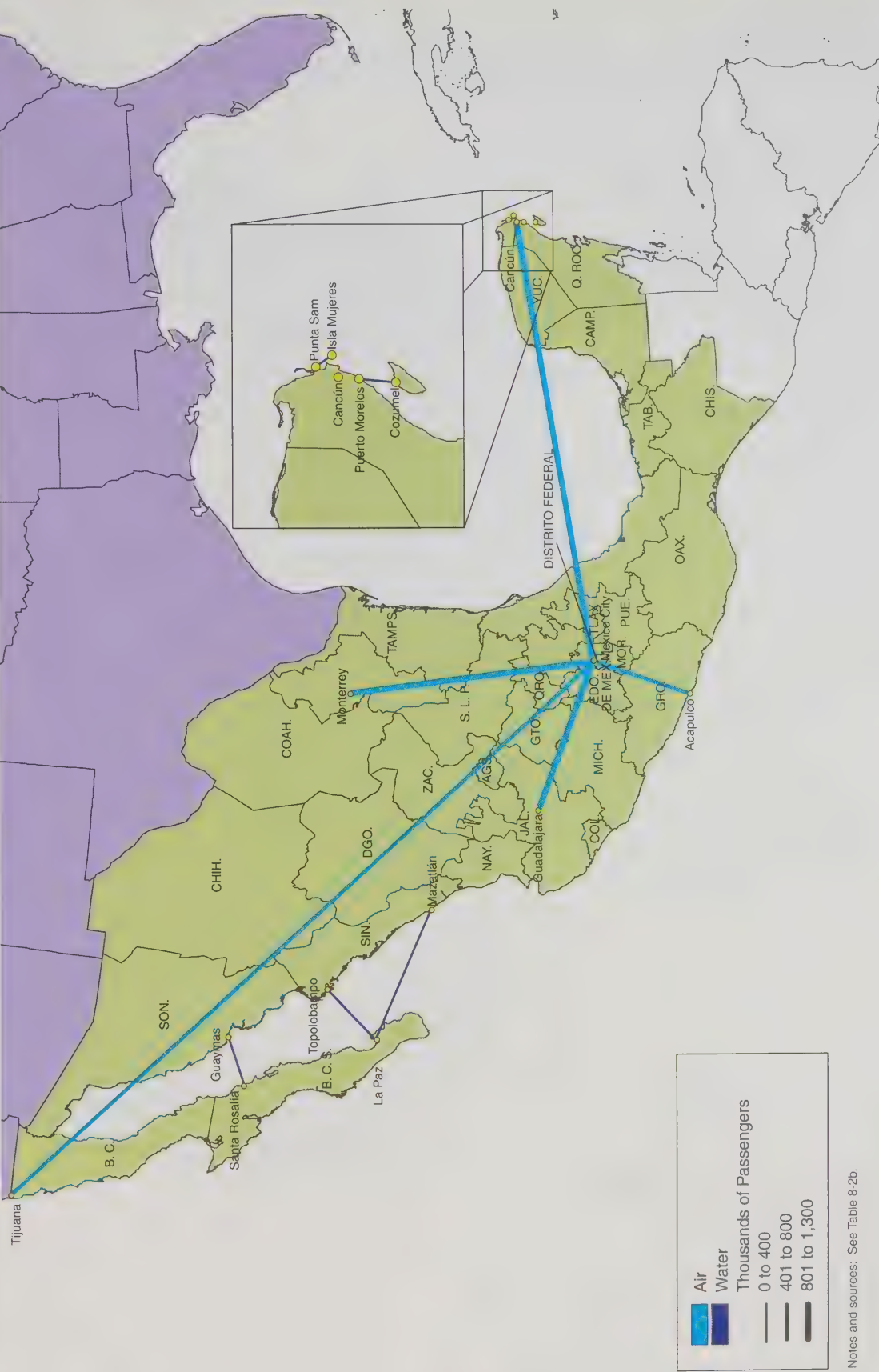
# Top Canadian Domestic Passenger Metropolitan Area Pairs by Mode: 1996



Notes and sources: See Table 8-2a.



# Top Mexican Domestic Passenger Metropolitan Area Pairs by Mode: 1996



Notes and sources: See Table 8-2b.

# Top U.S. Domestic Passenger Metropolitan Area Pairs by Mode: 1995

(Thousands of passengers)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>	<b>161,165</b>	New York, NY and Philadelphia, PA	158
Los Angeles, CA and San Francisco, CA	4,009	Los Angeles and San Francisco, CA	132
San Diego, CA and San Francisco, CA	1,411		
Los Angeles, CA and Phoenix, AZ	1,354	<b>Road</b>	<b>834,303</b>
Miami, FL and New York, NY	1,326	Los Angeles, CA and San Diego, CA	10,178
Las Vegas, NV and Los Angeles, CA	1,276	New York, NY and Philadelphia, PA	8,267
<b>Intercity rail</b>	<b>4,994</b>	Las Vegas, NV and Los Angeles, CA	7,844
New York, NY and Washington, DC	547	New York, NY and Washington, DC	6,603
San Diego, CA and Los Angeles, CA	212	Sacramento, CA and San Francisco, CA	5,272
Boston, MA and Washington, DC	169	<b>Water Transport</b>	<b>U</b>

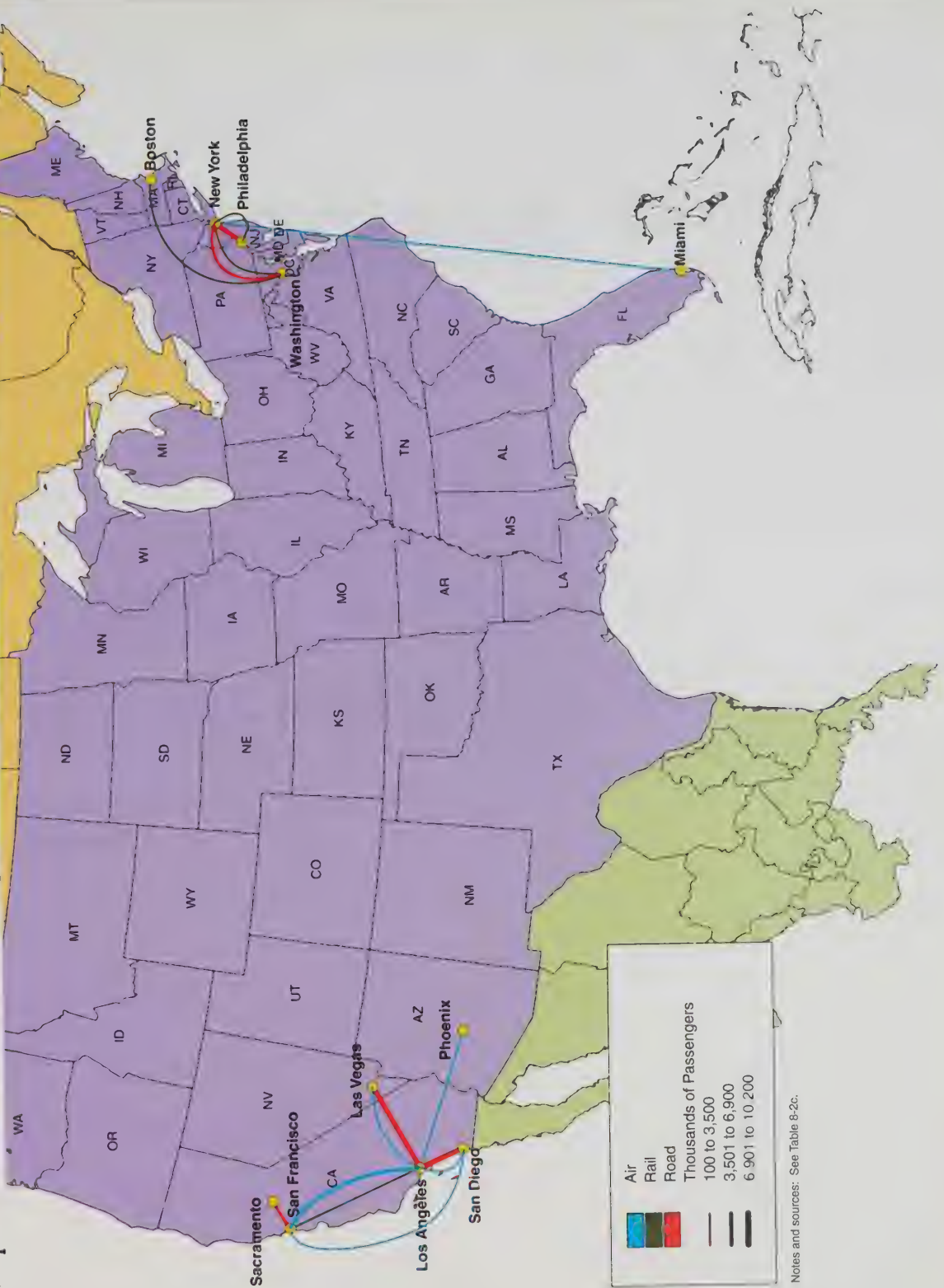
**KEY:** U = Data are unavailable.

**NOTES:** Data are based on trips over 100 miles one-way. Hence, trips between cities less than 100 miles apart are not included. Places are defined at the highest aggregation of metropolitan geography, either consolidated metropolitan statistical areas (CMSAs) or metropolitan statistical areas (MSAs).

**SOURCE:** U.S. Department of Transportation. Bureau of Transportation Statistics. *1995 American Travel Survey*. Special tabulation. (Washington, DC: 1996).

map 8

Top U.S. Domestic Passenger Metropolitan Area Pairs by Mode: 1995



Notes and sources: See Table 8-2c.





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section 9

North American  
Passenger Travel



**t a b l e** Table 9-1a

# Canada-Mexico/Mexico-Canada Travel by Mode of Transportation

(Thousands of visitors)

	1990	1995	1996
<b>Canadian source data</b>			
Canadian resident overnight travel to Mexico	433	406	438
Air	N	N	N
Land	N	N	N
Mexican resident overnight travel to Canada	64	63	81
Air	N	N	N
Land	N	N	N
<b>Mexican source data</b>			
Canadian resident overnight travel to Mexico	294	198	269
Air	268	167	233
Land	26	29	35
Mexican resident overnight travel to Canada	N	N	N
Air	17	14	17
Land	N	N	N

**KEY:** N = Data are nonexistent.**NOTE:** For information on Canada's and Mexico's travel surveys and definitions of specific types of international visitors and which of these visitors are included in the specific categories shown in Table 9-1a, see Appendix B.**SOURCES****Canada**Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

**table 9-1b**

# Canada-United States/United States-Canada Travel by Mode of Transportation

(Thousands of visitors)

	1990	1995	1996
<b>Canadian source data</b>			
<b>Canadian resident overnight travel to the United States</b>	<b>17,262</b>	<b>14,663</b>	<b>15,301</b>
Air	4,039	3,802	4,496
Land			
Motor vehicles	12,770	10,338	10,251
Personal vehicles	12,164	9,686	9,579
Intercity and charter buses	606	652	672
Intercity rail	36	34	33
Pedestrians	N	N	N
Other <sup>a</sup>	416	489	521
<b>Canadian resident same day travel to the United States</b>	<b>53,171</b>	<b>37,491</b>	<b>37,398</b>
Air	137	138	124
Land			
Motor vehicles	52,629	37,201	37,159
Personal vehicles	51,829	36,414	36,267
Intercity and charter buses	800	787	892
Intercity rail	N	N	N
Pedestrians	N	N	N
Other <sup>a</sup>	405	152	115
<b>U.S. resident overnight travel to Canada</b>	<b>12,252</b>	<b>13,005</b>	<b>12,909</b>
Air	2,372	2,769	3,047
Land			
Motor vehicles	9,103	9,451	9,097
Personal vehicles	8,381	8,702	8,325
Intercity and charter buses	722	749	772
Intercity rail	N	72	72
Pedestrians	N	N	N
Other <sup>a</sup>	778	713	692
<b>U.S. resident same day travel to Canada</b>	<b>22,482</b>	<b>24,325</b>	<b>25,563</b>
Air	165	260	365
Land			
Motor vehicles	21,412	23,604	24,700
Personal vehicles	20,692	22,746	23,804
Intercity and charter buses	720	858	896
Intercity rail	N	6	6
Pedestrians	N	N	N
Other <sup>a</sup>	905	455	492

<sup>a</sup>Other includes boat, pedestrians and cyclists.**KEY:** N = Data are nonexistent.



## Canada-United States/United States-Canada Travel by Mode of Transportation—Continued

### SOURCES

#### Canada

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

**United States:** The United States does not collect data on same day travel to or from the United States nor for Canadian resident overnight travel to the United States by all modes of transportation. U.S. agencies typically obtain this data from Statistics Canada. Although not used for the purposes of this table, the Bureau of Transportation Statistics' American Travel Survey provides mode of transportation data on U.S. resident travel to Canada for trips longer than 100 miles (approximately 160 kilometers). (See Appendix B for more information.)

**table 9-1c**

# Mexico-United States/United States-Mexico Travel by Mode of Transportation

(Thousands of visitors)

	1990	1995	1996
<b>Mexican source data</b>			
<b>Mexican resident overnight travel to the United States</b>	<b>7,040</b>	<b>8,189</b>	<b>8,709</b>
Air	959	796	983
Land	6,081	7,393	7,726
Motor vehicles	N	N	N
Personal vehicles	N	N	N
Intercity and charter buses	N	N	N
Intercity rail	NA	NA	NA
Pedestrians	N	N	N
Other	N	N	N
<b>Mexican resident same day travel to the United States</b>	<b>91,494</b>	<b>94,710</b>	<b>94,399</b>
Air	N	N	N
Land	91,494	94,710	94,399
Motor vehicles	U	U	U
Personal vehicles	N	N	N
Intercity and charter buses	N	N	N
Intercity rail	NA	NA	NA
Pedestrians	U	U	U
Other	N	N	N
<b>U.S. resident overnight travel to Mexico</b>	<b>16,377</b>	<b>19,221</b>	<b>20,302</b>
Air	3,635	4,741	5,361
Land	12,742	14,480	14,941
Motor vehicles	N	N	N
Personal vehicles	N	N	N
Intercity and charter buses	N	N	N
Intercity rail	NA	NA	NA
Pedestrians	N	N	N
Other	N	N	N
<b>U.S. resident same day travel to Mexico</b>	<b>64,038</b>	<b>63,508</b>	<b>66,859</b>
Air	N	N	N
Land	64,038	63,508	66,859
Motor vehicles	U	U	U
Personal vehicles	N	N	N
Intercity and charter buses	N	N	N
Intercity rail	NA	NA	NA
Pedestrians	U	U	U
Other	N	N	N

**KEY:** NA = Not applicable. N = Data are nonexistent. U = Data are unavailable.

**NOTE:** For information on Mexico's travel surveys and definitions of specific types of international visitors and which of these visitors are included in the categories shown in Table 9-1c, see Appendix B.

Mexican resident same day travel to the United States and U.S. resident same day travel to Mexico: Totals do not include same day travel by air.

**Mexico-United States/United States-Mexico Travel  
by Mode of Transportation—Continued**

**SOURCES**

**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

**United States**

The United States does not collect data on same day travel to or from the United States nor for Mexican resident overnight travel to the United States for all modes of transportation. Although not used for the purposes of this table, the Bureau of Transportation Statistics' American Travel Survey provides mode of transportation data on U.S. resident travel to Mexico for trips longer than 100 miles (approximately 160 kilometers). (See Appendix B for more information.)

**figure 9-1a**

### Percent Share of Total Travel Between Canada and Mexico: 1996

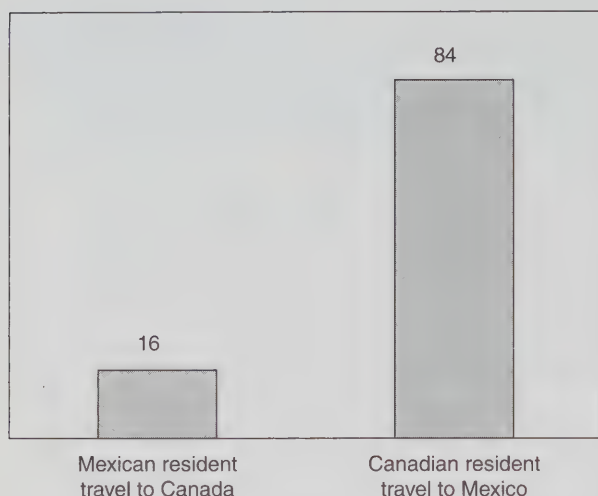
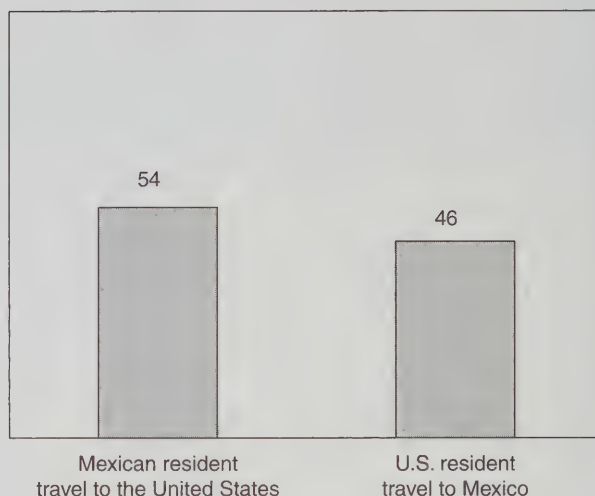


Figure 9-1a is based on Canadian data. Travel between Canada and Mexico only includes overnight travel.  
Notes and sources: See Table 9-1a.

**figure 9-1c**

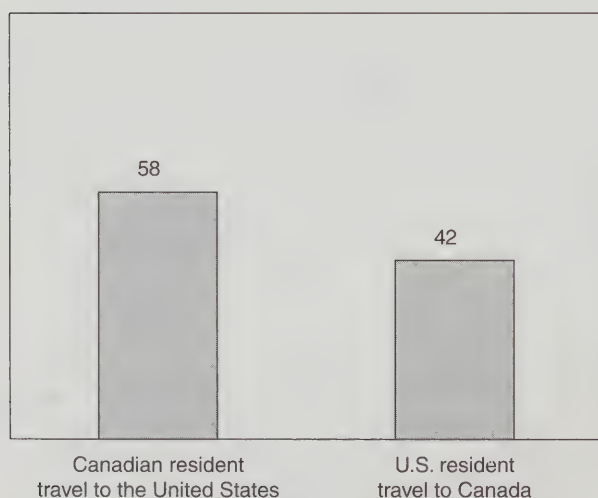
### Percent Share of Total Travel Between Mexico and the United States: 1996



Notes and sources: See Table 9-1c.

**figure 9-1b**

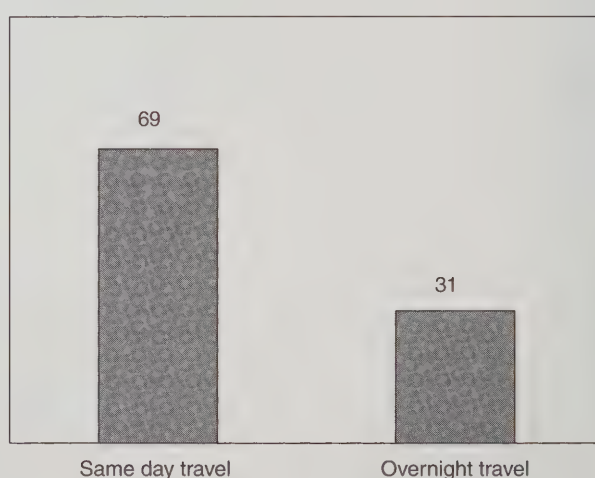
### Percent Share of Total Travel Between Canada and the United States: 1996



Notes and sources: See Table 9-1b.

**figure 9-1d**

### Same Day vs. Overnight Travel, Percent Share of Total Travel Between Canada and the United States: 1996

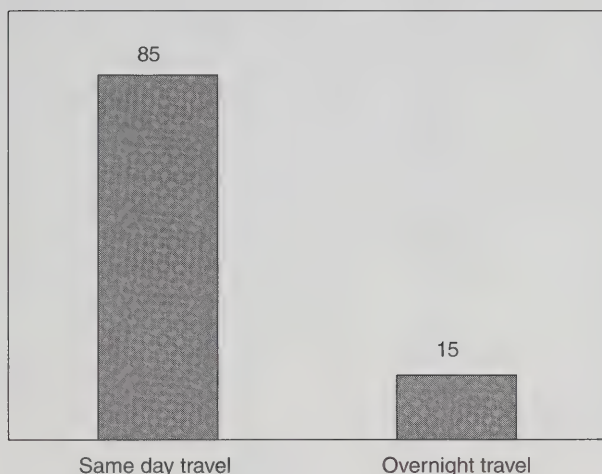


Notes and sources: See Table 9-1b.



**figure** 9-1e

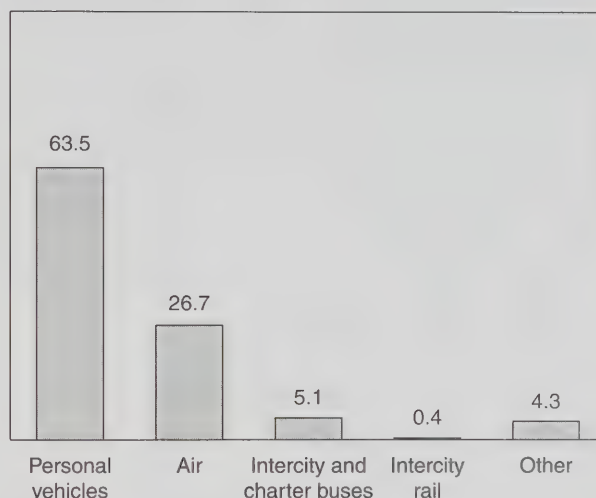
### Same Day vs. Overnight Travel, Percent Share of Total Travel Between Mexico and the United States: 1996



Notes and sources: See Table 9-1c.

**figure** 9-1g

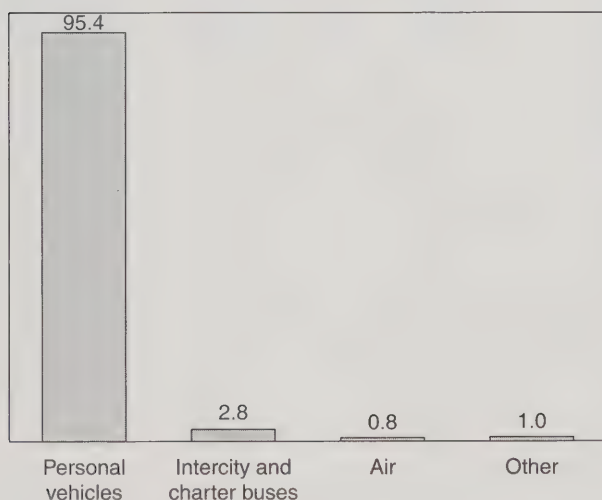
### Percent Modal Share of Canadian - U.S. Overnight Passenger Travel: 1996



Other modes include boat, pedestrians, and cyclists.  
Notes and sources: See Table 9-1b.

**figure** 9-1f

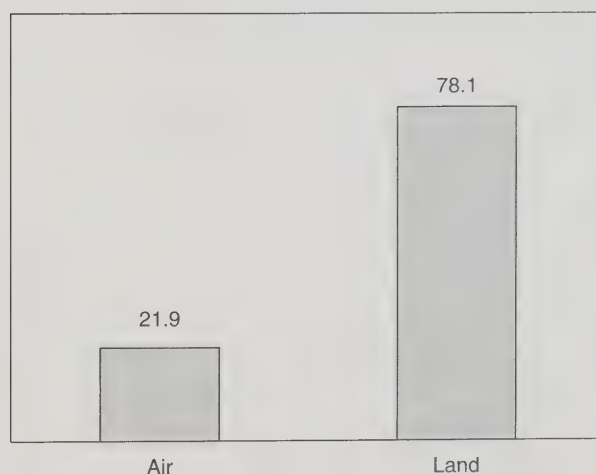
### Percent Modal Share of Canadian - U.S. Same Day Passenger Travel: 1996



Data for intercity rail are not available. Other modes include boat, pedestrians, and cyclists.  
Notes and sources: See Table 9-1b.

**figure** 9-1h

### Percent Modal Share of Mexican - U.S. Overnight Passenger Travel: 1996



Additional modal detail is unavailable.  
Notes and sources: See Table 9-1c.

**table 9-2a**

# Top Land Passenger Ports, Canadian-U.S. Border: 1996

(Thousands of vehicles or passengers/pedestrians)

Port name	Northbound	Southbound	Total
<b>Personal vehicles</b>			
<b>Canadian-U.S. border, total</b>	<b>38,858</b>	<b>39,537</b>	<b>78,394</b>
Detroit, MI/Windsor, Ont.	C	8,324	N
Ambassador/Windsor Bridge	C	N	N
Windsor-Detroit Tunnel	4,311	N	N
Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.	7,273	7,574	14,847
Buffalo, NY/Fort Erie, Ont.	3,190	N	N
Niagara Falls, NY/Niagara Falls, Ont.	4,083	N	N
Queenston Bridge	1,860	N	N
Rainbow Bridge	1,597	N	N
Whirlpool Bridge	626	N	N
Blaine, WA/Douglas and Pacific Highway, B.C.	4,056	4,667	8,723
Blaine, WA/Douglas, B.C.	2,293	N	N
Blaine, WA/Pacific Highway, B.C.	1,763	N	N
Port Huron, MI/Sarnia, Ont.	1,920	2,075	3,995
Sault Ste. Marie, MI/Sault Ste. Marie, Ont.	1,414	1,617	3,031
<b>Passengers in personal vehicles</b>			
<b>Canadian-U.S. border, total</b>	<b>77,975</b>	<b>100,444</b>	<b>178,419</b>
Detroit, MI/Windsor, Ont.	C	23,511	N
Ambassador/Windsor Bridge	C	N	N
Windsor-Detroit Tunnel	8,238	N	N
Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.	15,279	16,517	31,796
Buffalo, NY/Fort Erie, Ont.	6,242	N	N
Niagara Falls, NY/Niagara Falls, Ont.	9,037	N	N
Queenston Bridge	4,078	N	N
Rainbow Bridge	3,765	N	N
Whirlpool Bridge	1,194	N	N
Blaine, WA/Douglas and Pacific Highway, B.C.	7,761	11,387	19,148
Blaine, WA/Douglas, B.C.	4,357	N	N
Blaine, WA/Pacific Highway, B.C.	3,404	N	N
Port Huron, MI/Sarnia, Ont.	3,984	5,392	9,375
Sault Ste. Marie, MI/Sault Ste. Marie, Ont.	2,854	5,325	8,179
<b>Buses<sup>a</sup></b>			
<b>Canadian-U.S. border, total</b>	<b>N</b>	<b>174</b>	<b>N</b>
Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.	N	54	N
Buffalo, NY/Fort Erie, Ont.	N	N	N
Niagara Falls, NY/Niagara Falls, Ont.	N	N	N
Rainbow Bridge	N	N	N
Queenston Bridge	N	N	N
Whirlpool Bridge	N	N	N
Detroit, MI/Windsor, Ont.	N	40	N
Ambassador/Windsor Bridge	N	N	N
Windsor-Detroit Tunnel	N	N	N
Blaine, WA/Douglas and Pacific Highway, B.C.	N	19	N
Blaine, WA/Douglas, B.C.	N	N	N
Blaine, WA/Pacific Highway, B.C.	N	N	N
Champlain-Rouses Pt., NY/Lacolle (Routes 15, 221,223), Que.	N	11	N
Champlain, NY/Lacolle Route 15, Que.	N	N	N
Rouses Pt., NY/Lacolle Routes 221 and 223, Que.	N	N	N
Sault Ste. Marie, MI/Sault Ste. Marie, Ont.	N	10	N

table 9-2a

# Top Land Passenger Ports, Canadian-U.S. Border: 1996—Continued

(Thousands of vehicles or passengers/pedestrians)

Port name	Northbound	Southbound	Total
<b>Passengers on buses<sup>a</sup></b>			
<b>Canadian-U.S. border, total</b>	<b>3,232</b>	<b>3,871</b>	<b>7,103</b>
Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.	1,004	1,419	2,422
Buffalo, NY/Fort Erie, Ont.	306	N	N
Niagara Falls, NY/Niagara Falls, Ont.	698	N	N
Rainbow Bridge	463	N	N
Queenston Bridge	233	N	N
Whirlpool Bridge	2	N	N
Blaine, WA/Douglas and Pacific Highway, B.C.	300	479	780
Blaine, WA/Douglas, B.C.	0	N	N
Blaine, WA/Pacific Highway, B.C.	300	N	N
Detroit, MI/Windsor, Ont.	C	564	N
Ambassador/Windsor Bridge	C	N	N
Windsor-Detroit Tunnel	276	N	N
Champlain-Rouses Pt., NY/Lacolle (Routes 15, 221,223), Que.	240	288	528
Champlain, NY/Lacolle Route 15, Que.	239	N	N
Rouses Pt., NY/Lacolle Routes 221 and 223, Que.	0.9	N	N
Sault Ste. Marie, MI/Sault Ste. Marie, Ont.	170	122	292
<b>Pedestrians</b>			
<b>Canadian-U.S. border, total</b>	<b>965</b>	<b>614</b>	<b>1,579</b>
Buffalo-Niagara Falls, NY/Fort Erie-Niagara Falls, Ont.	359	264	623
Buffalo, NY/Fort Erie, Ont.	6	N	N
Niagara Falls, NY/Niagara Falls, Ont.	353	N	N
Rainbow Bridge	334	N	N
Queenston Bridge	18	N	N
Whirlpool Bridge	0.2	N	N
Sumas, WA/Huntingdon, B.C.	37	58	95
Calais, ME/St. Stephen, N.B.	36	42	78
Bar Harbour and Portland, ME/Yarmouth, N.S. <sup>b</sup>	34	35	69
Bar Harbour, ME/Yarmouth, N.S.	N	6	N
Portland, ME/Yarmouth, N.S.	N	29	N
International Falls-Rainer, MN/Fort Frances, Ont.	18	34	52

<sup>a</sup>Includes charter, intercity and school buses.

<sup>b</sup>Port is a pedestrian/ferry combination crossing.

**KEY:** C = Data are confidential. N = Data are nonexistent.

**SOURCES**
**Northbound**

Statistics Canada. Culture, Tourism and the Center for Education Statistics Division. Special tabulations. (Ottawa, Ont.: 1998).

**Southbound**

U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

**table 9-2b**

# Top Land Passenger Ports, Mexican-U.S. Border: 1996

(Thousands of vehicles or passengers/pedestrians)

Port name	Northbound	Southbound	Total
<b>Personal vehicles</b>			
<b>Mexico-U.S. border, total</b>	<b>75,589</b>	<b>N</b>	<b>N</b>
San Ysidro/Otay Mesa, CA/Tijuana, B.C.	17,160	N	N
El Paso, TX/Ciudad Juárez, Chih.	15,096	5,092	U
Laredo, TX/Nuevo Laredo, Tamps.	6,793	7,675	14,468
Calexico, CA/Mexicali, B.C.	6,139	N	N
Brownsville, TX/Matamoros, Tamps.	6,074	5,830	11,904
<b>Passengers in personal vehicles</b>			
<b>Mexico-U.S. border, total</b>	<b>203,999</b>	<b>N</b>	<b>N</b>
San Ysidro/Otay Mesa, CA/Tijuana, B.C.	42,864	N	N
El Paso, TX/Ciudad Juárez, Chih.	41,483	N	N
Hildago, TX/Rio Bravo, Tamps.	19,221	N	N
Calexico, CA/Mexicali, B.C.	18,296	N	N
Laredo, TX/Nuevo Laredo, Tamps.	16,932	N	N
<b>Buses<sup>a</sup></b>			
<b>Mexico-U.S. border, total</b>	<b>208,468</b>	<b>N</b>	<b>N</b>
San Ysidro/Otay Mesa, CA/Tijuana, B.C.	112,276	N	N
Hildago, TX/Rio Bravo, Tamps.	36,900	N	N
Laredo, TX/Nuevo Laredo, Tamps.	25,498	N	N
Del Rio, TX/Villa Acuña, Coah.	7,062	N	N
Brownsville, TX/Matamoros, Tamps.	5,570	N	N
<b>Passengers on buses<sup>a</sup></b>			
<b>Mexico-U.S. border, total</b>	<b>2,755</b>	<b>N</b>	<b>N</b>
San Ysidro/Otay Mesa, CA/Tijuana, B.C.	1,095	N	N
Hildago, TX/Rio Bravo, Tamps.	738	N	N
Laredo, TX/Nuevo Laredo, Tamps.	531	N	N
Brownsville, TX/Matamoros, Tamps.	111	N	N
El Paso, TX/Ciudad Juárez, Chih.	106	N	N
<b>Pedestrians</b>			
<b>Mexico-U.S. border, total</b>	<b>42,541</b>	<b>N</b>	<b>N</b>
San Ysidro/Otay Mesa, CA/Tijuana, B.C.	9,393	N	N
Calexico, CA/Mexicali, B.C.	7,374	N	N
Nogales, AZ/Nogales, Son.	4,417	N	N
El Paso, TX/Ciudad Juárez, Chih.	4,405	4,615	9,021
Brownsville, TX/Matamoros, Tamps.	3,801	3,157	6,958

<sup>a</sup>Includes charter, intercity and school buses.

**KEY:** N = Data are nonexistent. U = Data are unavailable.

**NOTE:** Personal vehicles and pedestrians, El Paso, TX/Ciudad Juárez, Chih. Northbound data are based on all El Paso entry crossings. Southbound data are based on a subset of these crossings.

## SOURCES

### Northbound

U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

### Southbound

Data compiled by Texas A&M International University, Texas Center for Border Economic and Enterprise Development based on original data from bridge operators. Web site: [www.tamui.edu/coba/txcntr/](http://www.tamui.edu/coba/txcntr/)



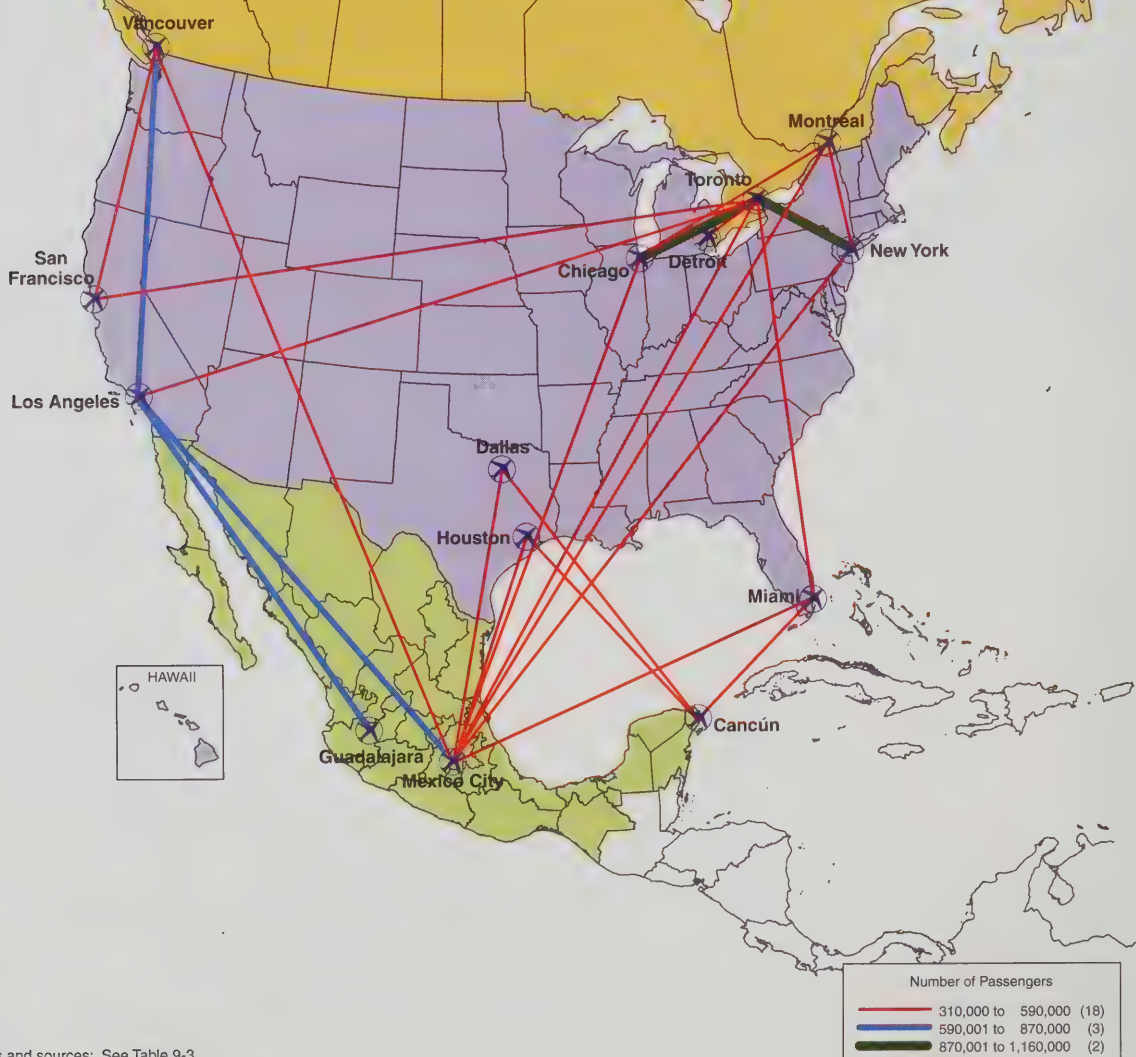
## Top North American Air Passenger City Pairs: 1996

(Number of passengers)

Top city pairs	Number of passengers	Top city pairs	Number of passengers
<b>Canada-Mexico</b>	<b>C</b>	<b>Mexico-United States, total</b>	<b>12,089,424</b>
Toronto-Mexico City/Mexico City-Toronto	C	Los Angeles-Mexico City/Mexico City-Los Angeles	743,340
Montréal-Mexico City/Mexico City-Montréal	C	Los Angeles-Guadalajara/Guadalajara-Los Angeles	675,267
Vancouver-Mexico City/Mexico City-Vancouver	C	Miami-Cancún/Cancún-Miami	566,141
<b>Canada-United States, total</b>	<b>15,005,834</b>	Houston-Mexico City/Mexico City-Houston	535,703
New York-Toronto/Toronto-New York	1,153,021	Dallas-Mexico City/Mexico City-Dallas	505,333
Chicago-Toronto/Toronto-Chicago	1,023,494	Miami-Mexico City/Mexico City-Miami	471,219
Los Angeles-Vancouver/Vancouver-Los Angeles	604,953	Dallas-Cancún/Cancún-Dallas	447,445
New York-Montréal/Montréal-New York	510,941	Chicago-Mexico City/Mexico City-Chicago	385,832
Miami-Toronto/Toronto-Miami	425,852	New York-Mexico City/Mexico City-New York	349,582
San Francisco-Vancouver/Vancouver-San Francisco	403,096	Houston-Cancún/Cancún-Houston	315,957
Chicago-Montréal/Montréal-Chicago	386,146		
Detroit-Toronto/Toronto-Detroit	357,795		
Los Angeles-Toronto/Toronto-Los Angeles	339,755		
San Francisco-Toronto/Toronto-San Francisco	328,938		

**KEY:** C = Data are confidential.**NOTE:** Canada-United States and Mexico-United States: These data represent the total number of passengers, both inbound and outbound traffic, traveling on scheduled and nonscheduled service of all U.S. and non-U.S. airlines. These data include origin and destination passengers and passengers traveling between these cities as part of a longer journey.**SOURCE:** Canada-United States and Mexico-United States: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *T-100 Database*. Special tabulation. (Washington, DC: 1998).

# Top North American Air Passenger City Pairs: 1996



Notes and sources: See Table 9-3.

**table 9-4a**

# Canada-Mexico/Mexico-Canada Travel by Trip Purpose

(Thousands of visitors)

	1990	1995	1996
<b>Canadian source data</b>			
<b>Canadian resident overnight travel to Mexico</b>	<b>433</b>	<b>406</b>	<b>438</b>
Pleasure/tourism	402	356	386
Business	13	32	38
Visit family and friends	10	10	6
Other <sup>a</sup>	9	8	7
<b>Mexican resident overnight travel to Canada</b>	<b>63</b>	<b>63</b>	<b>80</b>
Pleasure/tourism	39	38	46
Business	10	11	18
Visit family and friends	12	12	13
Other <sup>a</sup>	2	2	4
<b>Mexican source data</b>			
<b>Canadian resident overnight travel to Mexico</b>	<b>U</b>	<b>U</b>	<b>269</b>
Pleasure/tourism	U	U	210
Business	U	U	20
Visit family and friends	U	U	36
Other <sup>a</sup>	U	U	3
<b>Mexican resident overnight travel to Canada</b>	<b>U</b>	<b>U</b>	<b>17</b>
Pleasure/tourism	U	U	11
Business	U	U	4
Visit family and friends	U	U	1
Other <sup>a</sup>	U	U	1

<sup>a</sup>Other includes personal, in transit, shopping, educational study and other.

**KEY:** U = Data are unavailable.

## SOURCES:

### Canada

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

### Mexico

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

**table 9-4b**

# Canada-United States/United States-Canada Travel by Trip Purpose

(Thousands of visitors)

	1990	1995	1996
<b>Canadian source data</b>			
<b>Canadian resident overnight travel to the United States</b>	<b>17,262</b>	<b>14,663</b>	<b>15,301</b>
Pleasure/tourism	10,586	8,316	8,810
Business	1,972	2,260	2,422
Visit family and friends	2,701	2,626	2,653
Other <sup>a</sup>	2,003	1,462	1,418
<b>Canadian resident same day travel to the United States</b>	<b>53,171</b>	<b>37,491</b>	<b>37,398</b>
Pleasure/tourism	34,159	22,394	23,198
Business	3,567	2,971	2,899
Visit family and friends	4,703	3,473	3,235
Other <sup>a</sup>	10,741	8,650	8,066
<b>U.S. resident overnight travel to Canada</b>	<b>12,252</b>	<b>13,005</b>	<b>12,909</b>
Pleasure/tourism	7,012	7,498	7,392
Business	1,729	1,926	1,970
Visit family and friends	2,602	2,323	2,221
Other <sup>a</sup>	909	1,259	1,325
<b>U.S. resident same day travel to Canada</b>	<b>22,482</b>	<b>24,325</b>	<b>25,563</b>
Pleasure/tourism	10,958	11,839	13,018
Business	1,967	1,792	1,778
Visit family and friends	5,385	3,923	3,895
Other <sup>a</sup>	4,172	6,771	6,872

<sup>a</sup>Other includes personal, in transit, shopping, educational study and other.

## SOURCES

### Canada

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

### United States

The United States does not collect data on same day travel to or from the United States nor for Canadian overnight travel to the United States for all modes of transportation and with travel characteristics. U.S. agencies typically obtain this data from Statistics Canada. The American Travel Survey also provides trip purpose data on U.S. travel to Canada for trips longer than 100 miles (approximately 160 kilometers). (See Appendix B for more information.)



Canada-Mexico/Mexico-Canada Travel<sup>a</sup> Characteristics:  
1996

(Thousands of visitors)

	Pleasure/ tourism	Business	Visit family and friends	Other <sup>b</sup>	Total
<b>Canadian source data</b>					
<b>Canadian resident overnight travel to Mexico</b>					
<b>Trip quarter</b>	<b>386</b>	<b>38</b>	<b>6</b>	<b>8</b>	<b>438</b>
1st quarter of the year	235	5	3	4	247
2nd quarter of the year	45	5	1	3	54
3rd quarter of the year	27	19	1	1	48
4th quarter of the year	79	9	1	0	89
<b>Trip duration</b>	<b>386</b>	<b>38</b>	<b>6</b>	<b>8</b>	<b>438</b>
One-three nights	17	18	0	1	36
Four-thirteen nights	234	18	4	3	259
More than 14 nights	136	2	2	4	144
<b>Age and gender of visitor</b>	<b>386</b>	<b>38</b>	<b>6</b>	<b>8</b>	<b>438</b>
<b>Males, total</b>	<b>165</b>	<b>21</b>	<b>3</b>	<b>3</b>	<b>192</b>
Ages 14 and under	7	NS	NS	NS	7
Ages 15-34	49	4	1	1	55
Ages 35-64	90	16	1	1	108
Ages 65+	18	NS	NS	1	19
<b>Females, total</b>	<b>212</b>	<b>15</b>	<b>4</b>	<b>5</b>	<b>236</b>
Ages 14 and under	9	1	NS	0	10
Ages 15-34	73	4	1	2	80
Ages 35-64	113	10	2	2	127
Ages 65+	16	1	NS	2	19
<b>Gender not stated, total</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>11</b>
<b>Mexican resident overnight travel to Canada</b>					
<b>Trip quarter</b>	<b>46</b>	<b>18</b>	<b>13</b>	<b>4</b>	<b>81</b>
1st quarter of the year	8	1	1	0	10
2nd quarter of the year	12	5	2	1	20
3rd quarter of the year	18	8	9	1	36
4th quarter of the year	8	4	1	2	15
<b>Trip duration</b>	<b>46</b>	<b>18</b>	<b>13</b>	<b>4</b>	<b>81</b>
One-three nights	9	6	1	0	16
Four-thirteen nights	30	10	6	3	49
More than 14 nights	7	2	6	1	16
<b>Age and gender of visitor</b>	<b>46</b>	<b>18</b>	<b>13</b>	<b>4</b>	<b>81</b>
<b>Males, total</b>	<b>20</b>	<b>13</b>	<b>5</b>	<b>2</b>	<b>40</b>
Ages 14 and under	1	NS	2	0	3
Ages 15-34	12	4	1	2	19
Ages 35-64	6	8	2	0	16
Ages 65+	0	0	1	0	1
<b>Females, total</b>	<b>22</b>	<b>3</b>	<b>7</b>	<b>2</b>	<b>34</b>
Ages 14 and under	1	0	NS	0	1
Ages 15-34	12	1	4	1	18
Ages 35-64	9	2	3	1	15
Ages 65+	NS	NS	1	0	1
<b>Gender not stated, total</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>8</b>

<sup>a</sup>Travel here refers to trips of one or more nights.<sup>b</sup>Other trip purposes include personal, in transit, shopping, educational study and other.**KEY:** N = Data are nonexistent. NS = Not significant.

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**t a b l e 9-5a****Canada-Mexico/Mexico-Canada Travel<sup>a</sup> Characteristics:**  
1996–Continued**SOURCES****Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Mexican data was unavailable.

table 9-5b

# Canada-United States/United States-Canada Travel<sup>a</sup> Characteristics: 1996

(Thousands of visitors)

	Pleasure/ tourism	Business	Visit family and friends	Other <sup>b</sup>	Total
<b>Canadian source data</b>					
<b>Canadian resident overnight travel to the United States</b>					
<b>Trip quarter</b>	<b>8,809</b>	<b>2,421</b>	<b>2,653</b>	<b>1,417</b>	<b>15,300</b>
1st quarter of the year	2,094	565	501	239	3,399
2nd quarter of the year	2,068	676	635	365	3,744
3rd quarter of the year	3,165	624	907	494	5,190
4th quarter of the year	1,482	556	610	319	2,967
<b>Trip duration</b>	<b>8,809</b>	<b>2,421</b>	<b>2,653</b>	<b>1,417</b>	<b>15,300</b>
One-three nights	3,924	1,286	1,394	1,083	7,687
Four-thirteen nights	3,607	1,066	1,039	283	5,995
More than 14 nights	1,279	69	220	52	1,620
<b>Age and gender of visitor</b>	<b>8,809</b>	<b>2,421</b>	<b>2,653</b>	<b>1,417</b>	<b>15,300</b>
<b>Males, total</b>	<b>3,889</b>	<b>1,502</b>	<b>1,048</b>	<b>576</b>	<b>7,015</b>
Ages 14 and under	482	22	130	60	694
Ages 15-34	653	340	200	111	1,304
Ages 35-64	2,165	1,098	521	317	4,101
Ages 65+	589	42	197	88	916
<b>Females, total</b>	<b>4,427</b>	<b>733</b>	<b>1,416</b>	<b>714</b>	<b>7,290</b>
Ages 14 and under	491	27	140	58	716
Ages 15-34	870	226	321	168	1,585
Ages 35-64	2,445	449	713	377	3,984
Ages 65+	621	31	242	111	1,005
<b>Gender not stated, total</b>	<b>494</b>	<b>186</b>	<b>189</b>	<b>127</b>	<b>996</b>
<b>U.S. resident overnight travel to Canada</b>					
<b>Trip quarter</b>	<b>7,392</b>	<b>1,970</b>	<b>2,221</b>	<b>1,325</b>	<b>12,908</b>
1st quarter of the year	695	397	312	201	1,605
2nd quarter of the year	1,936	589	561	413	3,499
3rd quarter of the year	3,867	564	804	480	5,715
4th quarter of the year	894	420	544	231	2,089
<b>Trip duration</b>	<b>7,392</b>	<b>1,970</b>	<b>2,221</b>	<b>1,325</b>	<b>12,908</b>
One-three nights	4,433	1,356	1,332	877	7,998
Four-thirteen nights	2,765	600	789	427	4,581
More than 14 nights	194	14	100	21	329
<b>Age and gender of visitor</b>	<b>7,392</b>	<b>1,970</b>	<b>2,221</b>	<b>1,325</b>	<b>12,908</b>
<b>Males, total</b>	<b>3,291</b>	<b>1,301</b>	<b>955</b>	<b>653</b>	<b>6,200</b>
Ages 14 and under	344	18	109	57	528
Ages 15-34	618	213	181	123	1,135
Ages 35-64	1,744	1,027	492	356	3,619
Ages 65+	585	43	173	117	918
<b>Females, total</b>	<b>3,567</b>	<b>584</b>	<b>1,163</b>	<b>539</b>	<b>5,853</b>
Ages 14 and under	360	16	119	40	535
Ages 15-34	656	144	272	117	1,189
Ages 35-64	1,942	389	587	295	3,213
Ages 65+	609	35	185	87	916
<b>Gender not stated, total</b>	<b>534</b>	<b>84</b>	<b>103</b>	<b>133</b>	<b>854</b>

<sup>a</sup>Travel here refers to trips of one or more nights.<sup>b</sup>Other trip purposes include personal, in transit, shopping, educational study and other.

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**t a b l e 9-5b**

**Canada-United States/United States-Canada Travel<sup>a</sup>**  
**Characteristics: 1996–Continued**

**SOURCES**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**United States**

The United States does not collect data on same day travel to or from the United States nor for Canadian overnight travel to the United States for all modes of transportation and with travel characteristics. U.S. agencies typically obtain this data from Statistics Canada.



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10

International  
Passenger Travel  
Between North  
America and the  
Rest of the World



**table 10-1**

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**table 10-1****Passenger Travel Between North America and the Rest of the World  
by Mode of Transportation—Continued****Canada**

Travel to Canada: Represents nonresident visitors to Canada, excluding residents of the United States and Mexico.

Travel from Canada: Data are based on Canadian resident reentry data. Canadian resident reentry data represent Canadian residents returning from international destinations, other than the United States or Mexico. The reentry of Canadian residents to Canada may be made directly from an overseas country or via the United States. Canadian resident reentry data are similar but not exactly comparable with U.S. resident departure data. This is because Canadian residents may not necessarily leave and return by the same modes of transportation, and because Canadian residents could depart Canada in one calendar year and return in another.

**Mexico**

Travel to Mexico: Represents nonresident visitors to Mexico, excluding residents of Canada and the United States.

Travel from Mexico: Represents Mexican residents departing for international destinations other than Canada or the United States.

**United States**

Travel to the United States: Represents nonresident visitors to the United States, excluding residents of Canada and Mexico.

Travel from the United States: Represents U.S. residents departing for international destinations other than Canada or Mexico.

**SOURCES****Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope)*, Catalogue No. 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

**United States**

U.S. Department of Commerce. International Trade Administration. Tourism Industries Office. *Summary of International Travelers to the U.S. and 1996 Outbound Travel*. (Washington, DC: 1997).



table 10-2

# Top International Origins and Destinations Outside of North America: 1996

(Thousands of visitors)

	Total		Total		Total
<b>Canada</b>		<b>Mexico</b>		<b>United States</b>	
<b>Country of origin</b>		<b>Region of origin</b>		<b>Country of origin</b>	
United Kingdom	691	Central and South America	437	Japan	5,183
Japan	648	Europe	341	United Kingdom	3,246
France	460	Other (Australia and Africa)	44	Germany	1,997
Germany	447	Asia	U	France	987
Hong Kong	199			Brazil	848
South Korea	159			South Korea	749
Australia	149			Italy	525
Taiwan	132			Venezuela	447
Netherlands	114			Australia	463
Switzerland	107			Netherlands	440
<b>Destination country</b>		<b>Region of destination</b>		<b>Destination country</b>	
United Kingdom	737	Europe	181	United Kingdom	2,869
France	424	Central and South America	88	France	1,860
Germany	236	Other (Australia and Africa)	26	Germany	1,642
Cuba	222	Asia	12	Bahamas	1,504
Italy	183			Italy	1,385
Netherlands	177			Jamaica	1,029
Hong Kong	157			Japan	871
Switzerland	123			Netherlands	772
Dominican Republic	112			Hong Kong	752
Spain	92			Switzerland	693

**KEY:** U = Data are unavailable.

**NOTES:** Country/region of origin: Canadian data exclude residents of the United States and Mexico, even if the travel of a U.S. or Mexican resident originated in a third country, such as the United Kingdom. U.S. data exclude residents of Canada and Mexico, even if the travel of a Canadian or Mexican resident originated in a third country, such as the United Kingdom. Mexican data exclude residents of Canada and the United States and are only available at the regional level.

Destination country/region: Travel to countries within North America is excluded.

## SOURCES

### Canada

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue No. 66-201-XPB*. (Ottawa, Ont.: 1998).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

### Mexico

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

### United States

U.S. Department of Commerce. International Trade Administration. Tourism Industries Office. *Summary of International Travelers to the U.S. and 1996 Outbound Travel*. (Washington, DC: 1997).

**t a b l e 10-3**

# Top International Air Gateways, Excluding North American Travel: 1996

(Thousands of passengers)

Gateway city	Total	Gateway city	Total
<b>Canada</b>		<b>United States</b>	
Total, Number of air passengers with international origins and destinations	C	Total, number of air passengers with international origins and destinations	84,656
<b>Mexico</b>		New York, NY (Kennedy, LaGuardia and Newark airports)	20,145
Total, number of air passengers with international origins and destinations	1,779	Miami, FL	12,484
Mexico City, D.F.	1,360	Los Angeles, CA	9,660
Cancún, Q. Roo	408	Honolulu, HI	5,397
Mérida, Yuc.	9	San Francisco, CA	4,965
Villahermosa, Tab.	0.9	Chicago, IL	4,100
Chetumal, Q. Roo	0.8	Atlanta, GA	2,833
Palenque, Chis.	0.5	Washington, DC (National and Dulles airports)	2,486
Tuxtla Gutiérrez, Chis.	0.2	Boston, MA	2,341
		Detroit, MI	2,159

**KEY:** C = Data are confidential.

**NOTES:** Gateway represents the point of entry or exit for air passengers with international (non-North American) origins and destinations.

Mexico: These seven airports represent all Mexican international air gateways.

## SOURCES:

### Mexico

Aeropuertos y Servicios Auxiliares. *Resultado del Movimiento Aeroportuario. Enero-Diciembre, 1996.* (Mexico City, D.F.: 1997).

### United States

U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *T-100 Database.* (Washington, DC: 1998).

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s e c t i o n

11

# Transportation Infrastructure





table 11-1

# Domestic Physical System Extent

(Kilometers)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Road</b>	<b>888,898</b>	<b>901,904</b>	<b>U</b>	<b>239,235</b>	<b>307,983</b>	<b>312,301</b>	<b>6,244,000</b>	<b>6,296,000</b>	<b>6,331,000</b>
Paved	297,411	317,919	U	83,925	96,541	99,165	3,635,000	3,819,000	3,830,000
Major road system	N	N	N	81,517	92,782	94,908	655,000	692,000	697,000
Less than four lanes	N	N	N	75,995	83,772	85,346	451,000	468,000	470,000
Four or more lanes	15,516	16,571	U	5,522	9,010	9,562	206,000	224,000	227,000
Local	N	N	N	N	N	N	2,980,000	3,125,000	3,133,000
Unpaved	591,487	583,985	U	155,310	211,442	213,136	2,609,000	2,477,000	2,501,000
<b>Great Lakes</b>	<b>2,662</b>	<b>2,662</b>	<b>2,662</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>7,000</b>	<b>7,000</b>	<b>7,000</b>
<b>Inland waterways<sup>a</sup></b>	<b>2,825</b>	<b>2,825</b>	<b>2,825</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>42,000</b>	<b>42,000</b>	<b>42,000</b>
<b>Pipeline</b>	<b>274,151</b>	<b>309,772</b>	<b>314,124</b>	<b>18,003</b>	<b>15,616</b>	<b>15,529</b>	<b>2,278,262</b>	<b>2,353,910</b>	<b>2,364,985</b>
Gas	239,078	272,871	277,166	12,954	11,455	11,346	1,942,308	2,031,237	2,042,312
Oil	35,073	36,901	36,959	5,049	4,161	4,183	335,954	322,673	322,673
<b>Rail<sup>b</sup></b>	<b>86,880</b>	<b>80,326</b>	<b>77,387</b>	<b>26,361</b>	<b>26,613</b>	<b>26,612</b>	<b>321,988</b>	<b>290,356</b>	<b>284,818</b>
<b>Transit rail</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>197</b>	<b>275</b>	<b>275</b>	<b>N</b>	<b>6,329</b>	<b>6,961</b>

<sup>a</sup>Commercially navigable.

<sup>b</sup>Rail extent includes yard tracks, sidings and parallel lines.

**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

## NOTES

### All Countries

Road: The overall road total for Canada and the United States includes all roads (highways, local, and others). Canada cannot disaggregate its data for local roads into paved and unpaved, however.

Rail: Data include length of track, including yard tracks, sidings and parallel lines.

Transit rail: Data are one-way, fixed guideway.

### Mexico

Road: Data do not include local roads.

Road, paved: Data include major roads plus minor rural roads.

## SOURCES

### Canada

Road: Transportation Association of Canada. *Transportation in Canada: A Statistical Overview - 1995*. (Ottawa, Ont.: 1998).

Great Lakes and inland waterways: Transport Canada. *Marine Distance Library, 1997*. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities, Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

### Mexico

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Pipeline: Instituto Nacional de Estadística, Geografía e Informática, based on data from the Petróleos Mexicanos, Subdirección de Planeación and the *Anuario Estadístico* (various years). (Aguascalientes, Ags.: various years).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Transit: Instituto Nacional de Estadística, Geografía e Informática, based on data collected by the Sistema de Transporte Colectivo and the Sistema de Transporte Eléctrico in México City, the Sistema de Transporte Colectivo de la Zona Metropolitana in Guadalajara, and the Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).

# Domestic Physical System Extent—Continued

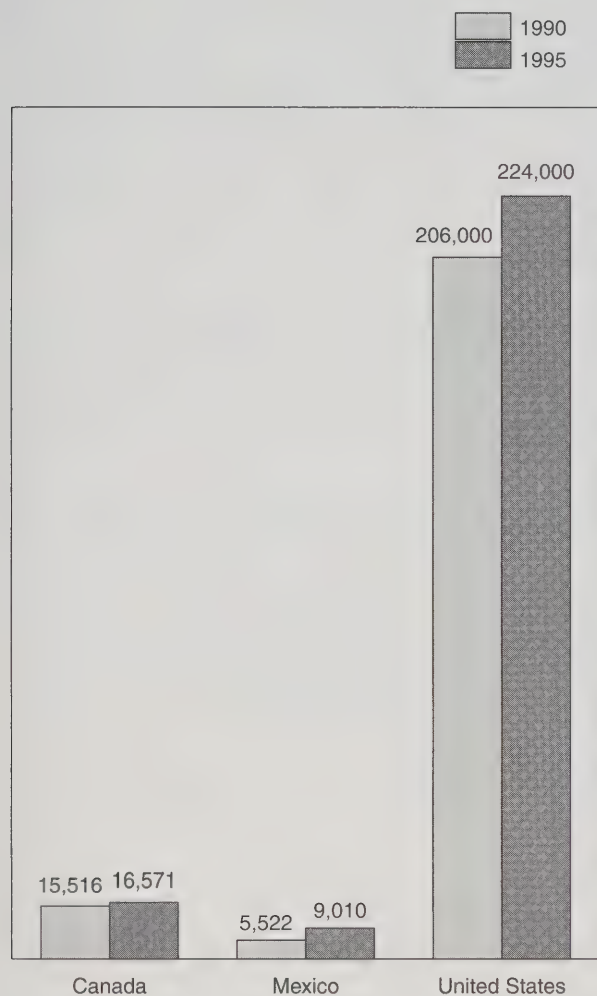
## United States

Road: U.S. Department of Transportation. Federal Highway Administration (FHWA). Unpublished data. (Washington, DC: 1998).  
 Great Lakes and inland waterways: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).  
 Gas pipeline: American Gas Association. *Gas Facts*. (Arlington, VA: 1997).  
 Oil pipeline: Eno Transportation Foundation, Inc. *Transportation in America*. (Lansdowne, VA: 1997).  
 Freight rail: Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997).  
 Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).  
 Transit rail: American Public Transit Association. *Transit Fact book 1996*. (Washington, DC: 1996).

**figure 11-1a**

## Extent of Road Network (4 or More Lanes): 1990 and 1995

(Road extent in kilometers)

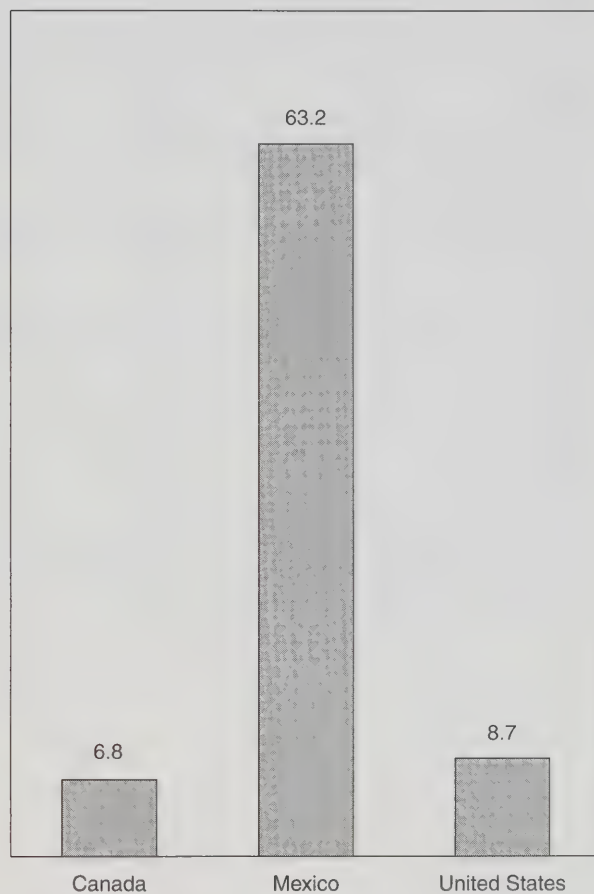


Notes and sources: See Table 11-1.

**figure 11-1b**

## Growth in Kilometers of Road (4 or More Lanes): 1990 to 1995

(Percent change)



Notes and sources: See Table 11-1.

**table 11-2**

# Number of Airports

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Airports, total</b>	<b>1,200</b>	<b>1,146</b>	<b>1,141</b>	<b>2,168</b>	<b>1,809</b>	<b>1,116</b>	<b>12,920</b>	<b>13,145</b>	<b>13,175</b>
<b>Certified airports, total</b>	<b>448</b>	<b>435</b>	<b>433</b>	<b>82</b>	<b>83</b>	<b>83</b>	<b>U</b>	<b>572</b>	<b>577</b>
Percent with control towers	13	10	10	65	67	69	U	U	<sup>a</sup> 67
Percent with lighted runways	92	93	93	67	66	67	U	U	<sup>a</sup> 100
Percent with runways greater than or equal to 3,048 meters (10,000 feet)	4	4	4	10	10	10	U	U	<sup>a</sup> 19

<sup>a</sup>Percentages as of April 1998. Historical percentages are unavailable.

**KEY:** U = Data are unavailable.

## NOTES

### All Countries

Data exclude heliports, stolports (short take-off and landing ports) and seaplane bases.

### United States

Certified airports total for 1990: See Appendix B for an explanation of the number of certified U.S. airports for 1990.

## SOURCES

### Canada

Natural Resources Canada. *Canada Flight Supplement*. (Ottawa, Ont.: 1998).

Transport Canada. *Aircraft Movement Statistics, TP577*. (Ottawa, Ont.: 1998).

### Mexico

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### United States

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Web site: [api.hq.faa.gov/handbook96/toc96.htm](http://api.hq.faa.gov/handbook96/toc96.htm)

U.S. Department of Transportation. Federal Aviation Administration. *Administrators Fact Book, August, 1998 and December 1993*. (Washington, DC: 1999 and 1994).

U.S. Department of Transportation. Federal Aviation Administration. Private Communication. (Washington, DC: 1998).



# Top 20 Canadian Airports by Flight Operations: 1996

(Number of flight operations (landings plus take-offs). Length and altitude in meters)

Airport name	Number of flight operations <sup>a</sup>	Length of longest runway	Altitude above sea level	International airport?
Toronto/L.B. Pearson, Ont.	372,308	3,368	173	Yes
Vancouver, B.C.	329,960	3,353	4	Yes
Calgary, Alta.	221,329	3,863	1,023	Yes
Montréal/Dorval, Que.	202,220	3,353	36	Yes
Winnipeg, Man.	126,233	3,353	239	Yes
Ottawa/MacDonald-Cartier, Ont.	124,239	2,942	114	Yes
Victoria, B.C.	106,779	2,135	19	No
Québec/Jean Lesage, Que.	103,464	2,743	74	Yes
Halifax, N.S.	97,725	2,682	145	Yes
Montréal/St.-Hubert, Que.	92,617	2,390	27	No
Edmonton International, Alta.	86,333	3,353	723	Yes
Edmonton City Centre, Alta.	80,555	1,789	671	No
Toronto/Buttonville, Ont.	71,683	1,189	198	No
Toronto City Centre, Ont.	64,307	1,219	77	No
London, Ont.	63,949	2,682	278	No
Boundary Bay, B.C.	61,215	1,145	2	No
Saskatoon/JG Diefenbaker, Sask.	59,488	2,530	504	No
Vancouver Harbour, B.C.	53,156	Heli-port	1	No
Thunder Bay, Ont.	51,341	1,890	199	No
Regina, Sask.	49,912	2,408	577	No

<sup>a</sup>Includes all civilian operations (air carriers, air taxis and general aviation), *excluding* local movements. For the definition of local movements, see Appendix B.

## SOURCES

Transport Canada. *Aircraft Movement Statistics, TP 577*. (Ottawa, Ont.: 1998).

Natural Resources Canada. *Canada Flight Supplement*. (Ottawa, Ont.: 1998).

# Top 20 Mexican Airports by Flight Operations: 1996

(Number of flight operations (landings plus take-offs). Length and altitude in meters)

Airport name	Number of flight operations <sup>a</sup>	Length of longest runway	Altitude above sea level	International airport?
Mexico City, D.F.	236,136	3,900	2,237	Yes
Guadalajara, Jal.	124,948	4,000	1,528	Yes
Monterrey, N.L.	76,004	3,000	387	Yes
Cancún, Q. Roo.	73,308	3,500	7	Yes
Toluca, Edo. de Méx.	48,088	4,200	2,575	Yes
Hermosillo, Son.	46,695	2,300	197	Yes
Culiacán, Sin.	44,561	2,300	33	Yes
Tijuana, B.C.	41,088	2,960	152	Yes
Chihuahua, Chih.	36,162	2,600	1,360	Yes
Puerto Vallarta, Jal.	34,683	3,100	6	Yes
Cd. del Carmen, Camp.	33,659	2,200	2	No
Acapulco, Gro.	28,334	3,300	5	Yes
Torreón, Coah.	27,854	2,750	1,126	Yes
Mazatlán, Sin.	24,447	2,700	10	Yes
Mérida, Yuc.	22,895	2,700	11	Yes
Bajío (León), Gto.	21,343	3,500	1,874	Yes
La Paz, B.C.S.	21,165	2,550	21	Yes
Tampico, Tamps.	20,383	2,250	25	Yes
San José del Cabo, B.C.S.	18,722	2,200	109	Yes
Villahermosa, Tab.	18,600	2,200	13	Yes

<sup>a</sup>Includes all civilian operations (air carriers, air taxis and general aviation), including local movements. (Canadian and U.S. data in Tables 11-2a and 11-2c exclude local movements.) For the definition of local movements, see Appendix B.

**SOURCE:** Aeropuertos y Servicios Auxiliares. *Resultado del Movimiento Aeroportuario, Enero-Diciembre de 1996*. (Mexico City, D.F.: 1997).

**table 11-2c**

## Top 20 U.S. Airports by Flight Operations: 1996

(Number of flight operations (landings plus take-offs). Length and altitude in meters)

Airport name	Number of flight operations <sup>a</sup>	Length of longest runway	Altitude above sea level	International airport?
Chicago/O'Hare Int'l, IL	906,787	3,962	204	Yes
Dallas/Ft Worth Int'l, TX	874,735	4,085	184	Yes
Los Angeles Int'l, CA	760,482	3,685	38	Yes
Atlanta Int'l, GA	758,311	3,624	313	Yes
Detroit Metro Wayne, MI	536,892	3,658	195	Yes
Miami Int'l, FL	528,816	3,962	3	Yes
Phoenix/Sky Harbor Int'l, AZ	514,767	3,353	345	Yes
St. Louis Int'l, MO	508,012	3,359	184	Yes
Minneapolis/St. Paul Int'l, MN	479,807	3,355	256	Yes
Boston/Logan Int'l, MA	464,360	3,073	6	Yes
Las Vegas/McCarran Int'l, NV	442,250	4,421	664	Yes
Charlotte/Douglas Int'l, NC	455,751	3,048	228	Yes
Newark, NJ	454,191	2,835	5.5	Yes
Denver Int'l, CO	452,328	3,658	1,655	Yes
Pittsburgh Greater Int'l, PA	443,158	3,505	367	Yes
San Francisco, CA	425,433	3,618	3	Yes
Philadelphia Int'l, PA	411,493	3,200	7	Yes
Cincinnati Greater Int'l, KY <sup>b</sup>	399,989	3,353	273	Yes
Houston Intercontinental, TX	395,794	3,658	30	Yes
Seattle/Tacoma Int'l, WA	395,022	3,627	131	Yes

<sup>a</sup>Includes all civilian operations (air carriers, air taxis and general aviation), *excluding* local movements. For the definition of local movements, see Appendix B.

<sup>b</sup>Cincinnati Greater International Airport *is* in Kentucky.

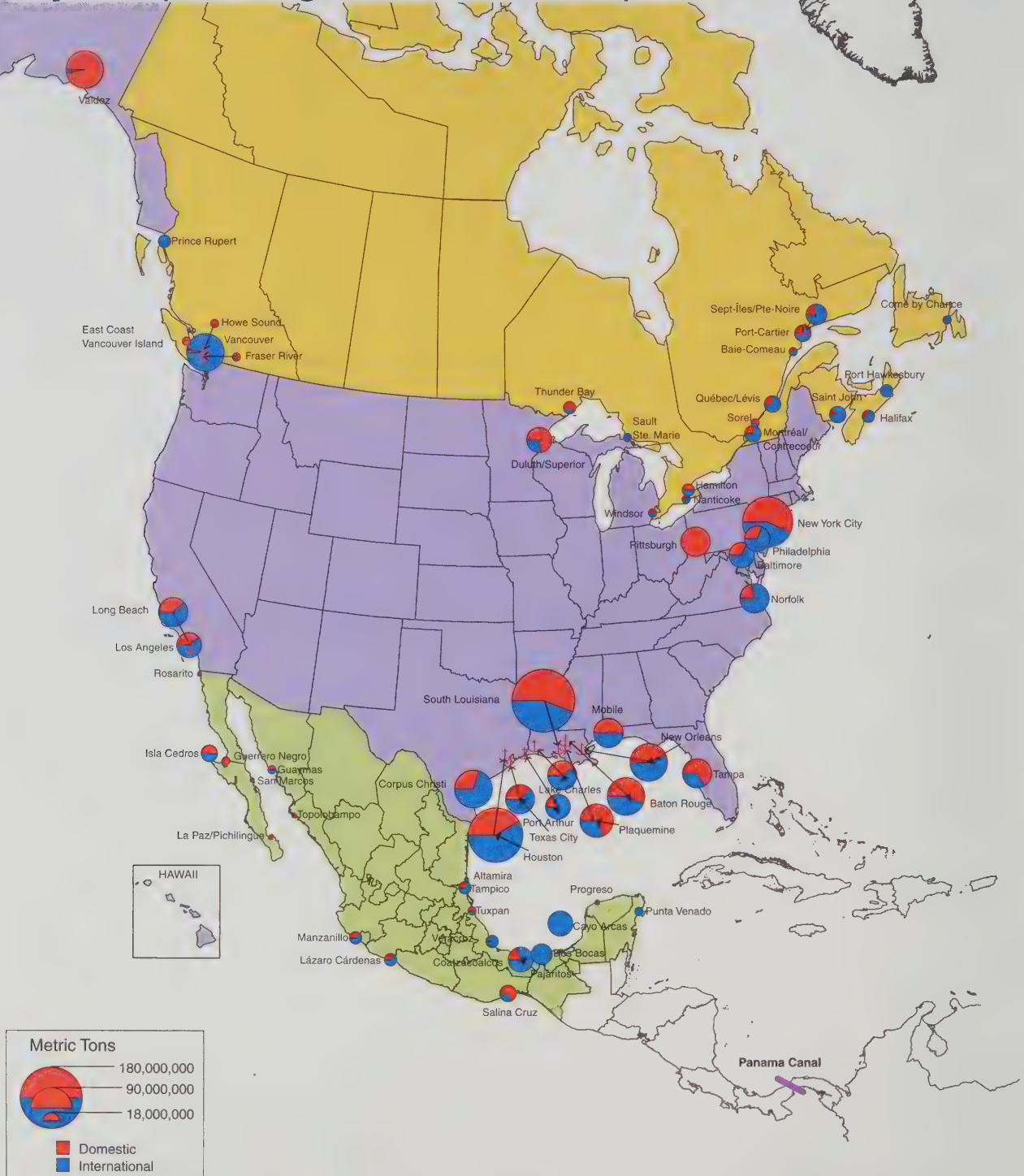
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U.S. Department of Transportation. Federal Aviation Administration. Office of Aviation Policy and Plans. Information Systems Branch. Private communication. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Aviation Administration. Office of Airport Safety and Standards. Airport Safety and Operations Division. Special tabulation. (Washington, DC: 1998).

# North American Water Ports, Top 20 by Tonnage for Each Country: 1996



Notes and sources: See Tables 11-4a, b and c.



**table 11-3**

## Number of Water Ports and Facilities

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total</b>	<b>187</b>	<b>167</b>	<b>172</b>	<b>107</b>	<b>109</b>	<b>109</b>	<b>305</b>	<b>309</b>	<b>321</b>
Coastal	118	99	104	107	109	109	187	183	194
Atlantic	82	60	62	NA	NA	NA	59	58	62
Gulf of Mexico	NA	NA	NA	45	46	46	37	38	38
Pacific	36	39	42	48	49	49	83	79	86
Caribbean	NA	NA	NA	14	14	14	8	8	8
Great Lakes	51	46	44	NA	NA	NA	73	82	82
Inland	18	22	24	NA	NA	NA	45	44	45

**KEY:** NA = Not applicable.

### SOURCES

#### Canada

Statistics Canada. Transportation Division. Special tabulation. (Ottawa, Ont.: 1998).

#### Mexico

Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

#### United States

U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

**t a b l e 11-4a**

# Top 20 Canadian Water Ports by Tonnage (Domestic and International): 1996

(Thousands of metric tons)

Port name	Total	Domestic	International	Containerized shipments (as percent of total tonnage)	Number of vessel entrances/ clearances
Vancouver, B.C.	71,405	1,989	69,416	7.2	5,673
Sept-Îles/Pte-Noire, Que.	22,584	4,217	18,367	NS	615
Port-Cartier, Que.	21,729	5,132	16,597	NS	521
Saint John, N.B.	20,575	1,951	18,624	1.2	825
Montréal/Contrecoeur, Que.	19,208	5,261	13,947	41.1	1,827
Québec/Lévis, Que.	16,987	3,681	13,306	NS	740
Halifax, N.S.	13,587	2,699	10,888	29.6	1,761
Hamilton, Ont.	12,757	6,189	6,568	NS	638
Thunder Bay, Ont.	10,101	6,565	3,536	NS	518
Prince Rupert, B.C.	9,452	14	9,438	NS	561
Port Hawkesbury, N.S.	7,885	33	7,852	NS	180
Fraser River, B.C.	7,527	5,401	2,126	1.6	3,479
Come-By-Chance, Nfld.	7,431	104	7,327	NS	148
Nanticoke, Ont.	6,790	1,671	5,119	NS	305
Baie-Comeau, Que.	5,867	1,834	4,033	NS	1,089
Sorel, Que.	5,580	3,306	2,274	NS	317
Sault Ste. Marie, Ont.	5,152	545	4,607	NS	291
Windsor, Ont.	5,080	2,507	2,573	NS	422
Howe Sound, B.C.	4,864	4,856	8	NS	2,517
East Coast Vancouver Island, B.C.	4,062	4,062	0	NS	2,467
Subtotal-top 20 ports	278,623	62,017	216,606	6.3	24,894
<b>Tonnage, total all Canadian water ports</b>	<b>357,756</b>	<b>97,658</b>	<b>260,098</b>	<b>NA</b>	<b>NA</b>
<b>Percent of tonnage of all Canadian water ports</b>	<b>77.9</b>	<b>63.6</b>	<b>83.3</b>	<b>5.0</b>	<b>NA</b>

KEY: NA = Not applicable. NS = Not significant.

NOTE: Ports are ranked by total tonnage.

**SOURCES**Statistics Canada. *Shipping in Canada, Catalogue No. 54-205-XPB, 1996. (Ottawa, Ont.: 1998).*

Statistics Canada. Transportation Division. Special tabulations. (Ottawa, Ont.: 1998).

**table 11-4b**

# Top 20 Mexican Water Ports by Tonnage (Domestic and International): 1996

(Thousands of metric tons)

Port name	Total	Domestic	International	Containerized shipments (as percent of total tonnage)	Number of vessel entrances/ clearances
Cayo Arcas, Camp.	31,471	4	31,467	NA	417
Pajaritos, Ver.	31,352	6,080	25,272	NA	954
Dos Bocas, Tab.	23,437	44	23,393	NA	1,145
Salina Cruz, Oax.	16,798	11,598	5,200	0.8	537
Isla Cedros, B.C.	14,784	7,509	7,275	NA	1,189
Lázaro Cárdenas, Mich.	12,007	3,721	8,286	0.8	425
Manzanillo, Col.	9,994	3,818	6,176	16.8	704
Veracruz, Ver.	9,917	631	9,286	23.2	1,396
Tampico, Tamps.	8,374	2,390	5,984	6.4	1,148
Tuxpan, Ver.	7,047	4,226	2,821	0.1	327
Guerrero Negro, B.C.S.	6,890	6,890	N	NA	1,077
Guaymas, Son.	5,660	2,453	3,207	NA	496
Punta Venado, Q. Roo	6,021	NS	6,021	NA	106
Topolobampo, Sin.	2,971	2,803	168	NA	247
San Marcos, B.C.S.	2,786	6	2,780	NA	308
Rosarito, B.C.	2,638	1,625	1,013	NA	99
Coatzacoalcos, Ver.	2,433	545	1,888	NA	287
Altamira, Tamps.	2,414	125	2,289	41.6	667
Progreso, Yuc.	2,322	947	1,375	3.7	462
La Paz-Pichilingue, B.C.S.	2,015	1,852	163	NS	600
Subtotal-top 20 ports	201,331	57,267	144,064	2.9	12,591
<b>Tonnage, total all Mexican water ports</b>	<b>208,581</b>	<b>63,450</b>	<b>145,131</b>	<b>NA</b>	<b>NA</b>
<b>Percent of tonnage of all Mexican water ports</b>	<b>96.5</b>	<b>90.3</b>	<b>99.3</b>	<b>2.9</b>	<b>NA</b>

**KEY:** N = Data are nonexistent. NA = Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

**SOURCE:** Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

**table 11-4c**

# Top 20 U.S. Water Ports by Tonnage (Domestic and International): 1996

(Thousands of metric tons)

Port name	Total	Domestic	International	Containerized shipments (as percent of total tonnage)	Number of vessel entrances/ clearances
South Louisiana, LA	172,200	96,204	75,996	NS	153,386
Houston, TX	134,432	55,452	78,979	4.0	122,329
New York, NY and NJ	119,389	68,145	51,244	12.6	228,526
New Orleans, LA	75,957	33,398	42,559	3.6	125,116
Baton Rouge, LA	73,492	41,026	32,466	NS	68,922
Corpus Christi, TX	72,993	21,629	51,364	NS	32,957
Valdez, AK	69,960	68,006	1,954	NS	3,186
Plaquemine, LA	60,701	41,932	18,769	NS	65,780
Long Beach, CA	52,976	20,292	32,684	35.0	56,465
Texas City, TX	51,160	19,108	32,052	NS	23,462
Pittsburgh, PA	46,153	46,153	-	NS	118,283
Mobile, AL	46,144	23,014	23,129	NS	47,943
Tampa, FL	44,718	29,443	15,275	NS	10,234
Norfolk Harbor, VA	44,690	9,411	35,279	15.0	32,064
Lake Charles, LA	44,540	17,913	26,627	NS	49,303
Los Angeles, CA	41,449	16,267	25,183	37.8	37,226
Baltimore, MD	39,511	12,696	26,814	8.7	34,208
Philadelphia, PA	37,996	11,807	26,188	2.6	25,185
Duluth-Superior, MN and WI	37,557	27,440	10,116	NS	2,400
Port Arthur, TX	33,710	5,896	27,813	NS	12,890
Subtotal-top 20 ports	1,200,060	565,569	634,491	6.0	1,249,865
<b>Tonnage, total all U.S. water ports</b>	<b>2,072,090</b>	<b>998,529</b>	<b>1,073,561</b>	<b>NA</b>	<b>NA</b>
<b>Percent of tonnage of all U.S. water ports</b>	<b>57.9</b>	<b>56.6</b>	<b>59.1</b>	<b>6.0</b>	<b>NA</b>

KEY: NA = Not applicable. NS = Not significant.

NOTE: Ports are ranked by total tonnage.

**SOURCES**Tonnage: U.S. Army Corps of Engineers. *Waterborne Commerce of the United States, National Summaries, Part 5*. (New Orleans, LA: 1996).

Percent of containerized shipments: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).



**table 11-5**

# Toll Roads, Bridges and Tunnels

(Kilometers of toll roads or number of bridges/tunnels)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
Toll roads, (total, kilometers)	290	290	290	1,761	6,338	6,378	7,034	7,002	N
Toll bridges (total, number)	14	14	14	31	38	38	146	139	N
Toll tunnels (total, number)	1	1	1	0	0	1	9	9	N

**KEY:** N = Data are nonexistent.

## NOTE

### All Countries

Intercountry toll bridges between the United States and Canada and the United States and Mexico have been included in the totals for each country. United States and Canadian data both include 11 international bridges and 1 international tunnel on the Canadian-U.S. border. United States and Mexican data both include 18 international bridges.

## SOURCES

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Transport Canada. Highway Policy Group. Special Tabulation. (Ottawa, Ont.: 1998).

### Mexico

Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

### United States

U.S. Department of Transportation. Federal Highway Administration. *Toll Facilities in the United States: Bridges, Roads, Tunnels, Ferries*. (Washington, DC: various years).



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s e c t i o n

12

# Transportation Vehicles





# Number of Transportation Vehicles/Equipment

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Air</b>									
Commercial aircraft	23,674	22,714	22,685	5,874	6,426	6,255	<sup>a</sup> 197,200	196,800	201,900
Jets	5,775	5,752	5,816	847	1,283	1,184	<sup>a</sup> 16,125	18,270	18,597
Non-jets	344	380	414	100	175	177	<sup>a</sup> 5,166	5,724	6,158
General aviation	5,431	5,372	5,402	33	57	57	<sup>a</sup> 10,959	12,546	12,439
	17,899	16,962	16,869	5,027	5,143	5,071	<sup>a</sup> 181,100	178,500	183,300
<b>Road</b>									
Personal vehicles	16,981,130	<sup>f</sup> 17,048,297	<sup>f</sup> 17,182,626	10,165,715	11,917,543	12,395,935	193,057,376	205,427,212	210,236,393
Passenger cars	12,981,053	13,512,653	13,562,927	7,089,059	8,183,903	8,623,267	186,234,513	198,022,288	202,533,376
Motorcycles	12,622,038	13,192,272	13,251,146	6,839,337	8,046,926	8,436,909	133,700,496	128,386,775	129,728,341
Light trucks	359,015	320,381	311,781	249,722	136,977	186,358	4,259,462	3,897,191	3,871,237
	N	N	N	N	N	N	48,274,555	65,738,322	68,933,798
Buses	63,962	64,339	64,550	94,575	121,870	<sup>p</sup> 98477	626,987	685,503	696,609
Charter	1,810	2,661	3,305	U	U	U	N	N	N
Intercity	1,356	1,191	1,052	30,579	47,254	<sup>p</sup> 43,533	N	N	N
Local motor	11,243	10,852	10,797	U	U	U	58,714	67,107	<sup>p</sup> 67,874
School	29,726	27,934	27,855	U	U	U	N	N	N
Commercial freight vehicles	176,368	181,568	206,305	2,982,081	3,611,770	3,674,191	6,195,876	6,719,421	7,006,408
Single-unit trucks	40,719	33,463	35,290	U	U	U	4,486,981	5,023,670	5,264,554
Tractors	66,919	87,662	92,059	U	U	U	1,708,895	1,695,751	1,741,854
<b>Rail</b>									
Cars									
Freight cars	123,137	110,784	109,578	46,602	35,042	29,438	1,108,734	1,134,203	1,153,209
Intercity passenger train cars	1,088	517	466	1,427	767	513	1,863	1,722	1,730
Locomotives	3,562	3,299	3,258	1,677	1,400	1,318	19,153	19,125	19,568
Freight	3,351	3,171	3,142	U	U	U	18,835	18,812	19,269
Intercity passenger	211	128	116	U	U	U	318	313	299
<b>Transit</b>									
Transit railcars	13,156	13,140	13,049	N	N	N	92,961	115,874	<sup>p</sup> 119,556
	1,913	2,288	2,252	238	322	331	15,747	15,721	<sup>p</sup> 16,006

**table 12-1**

# Number of Transportation Vehicles/Equipment—Continued

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Water transport<sup>b</sup></b>									
Passenger vessels	N	N	N	N	N	N	N	237,733	244,683
Recreational boats	N	N	N	62	58	57	U	159,177	168,576
Passenger cruise	N	N	N	N	N	N	U	154,369	163,756
Other passenger	55	52	50	N	N	N	U	126	136
	87	87	88	62	58	57	U	4,682	4,684
Freight vessels	1,082	747	734	1,938	1,916	1,903	U	74,375	76,107
Liquid	47	31	29	34	33	32	4,216	4,181	4,116
Tanker	44	31	29	34	33	32	213	195	178
Tank/barge	3	0	0	N	N	N	4,003	3,986	3,938
Dry bulk carrier	83	74	73	3	1	1	81	78	72
Other dry cargo	89	40	40	242	229	222	27,940	28,039	29,429
Container	1	1	1	N	N	N	89	91	88
Specialized carrier	5	0	0	13	13	13	143	181	180
General cargo	62	39	39	22	16	15	592	390	386
Dry cargo barge	21	0	0	207	200	194	27,116	27,377	28,775
Miscellaneous types	863	602	592	1,659	1,653	1,648	U	42,077	42,490
Fishing	512	312	298	1,437	1,392	1,392	U	35,658	36,038
Offshore vessels	44	23	27	25	56	56	1,177	1,291	1,275
Tow boats <sup>c</sup>	0	178	178	80	97	91	5,213	5,128	5,177
Other	307	89	89	117	108	109	N	N	N

<sup>a</sup>Air data are for 1992, the earliest year for which data are broken out in this fashion.

<sup>b</sup>Unless noted, water transport vessels represent those which are operated by the individual country but not necessarily owned. Vessels are organized according to the International Classification of Ship Type (ICST).

<sup>c</sup>Towboats include both pushboats and tugboats.

**KEY:** N = Data are nonexistent. p = Data are preliminary. r = Data are revised. U = Data are unavailable.

# Number of Transportation Vehicles/Equipment—Continued

## NOTES

### All Countries

**Air:** For Canada and the United States, on-demand air taxis are included in commercial aircraft and are excluded from general aviation. For the United States, this is different from the way the data are sometimes presented. For Mexico, air taxis are included in the total for commercial aircraft and are not identifiable as jet and non-jet in the registration files.

**Road:** Personal vehicles, light trucks: Mexico's total for personal vehicles includes light trucks (such as sports utility vehicles, pickups and minivans). However, it is not possible to further disaggregate light trucks. The U.S. total for personal vehicles does include light trucks, and light trucks are also identified as a separate vehicle category. Mexico may also include light trucks such as pickups in its total for commercial freight vehicles. Canada's total for personal vehicles *does not* include light trucks. However, light trucks are included in Canada's overall road total.

**Water Transport:** Freight vessels: The total for freight vessels represents the sum of the liquid, dry bulk carrier, other dry cargo and miscellaneous type vessel categories. Mexican data for container and tank barge vessels have not been included in its total because data for these types of vessels are nonexistent.

### Canada

**Buses (charter, intercity and local motor):** Data are derived from a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus, charter and other types of bus service from Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*. Local motor buses are also included in the total number of transit vehicles.

**Commercial freight vehicles:** Data are based on Statistics Canada's *Motor Carriers of Freight Survey*, supplemented by data from Canada's vehicle registration files. The figure for commercial freight vehicles is not a sum of single-unit trucks and truck-tractors, because other types of freight vehicles are included in the commercial freight vehicles total. Data for single-unit trucks and truck-tractors are estimates for owner-operators and/or Canadian for-hire motor carriers earning annual revenues greater than or equal to \$25,000 (Canadian).

**Transit:** The total for Canadian transit includes transit rail and local motor bus. Transit rail includes commuter rail, heavy rail and light rail.

### Mexico

**Commercial aircraft:** Includes taxis not identified in the records as jets or non-jets. Data for taxis are 714 in 1990, 1,051 in 1995 and 950 in 1996.

**Road (intercity buses and commercial freight vehicles):** Data refer to vehicles devoted to the federal public service and private service.

### United States

**Air and general aviation:** Rounded to the nearest 100.

**Road:** All U.S. road data represent registered vehicles, except local motor buses which are active passenger vehicles. Totals for all road vehicles comprise all types of buses including intercity, charter, school and local motor bus. Local motor buses are also included in the total number of transit vehicles. Passenger cars include taxis. Light trucks include vans, pickup trucks and sports/utility vehicles

**Rail:** Freight rail cars (except those owned by car companies and shippers) and locomotives are Class I railroads only. See Appendix B for the number of freight rail cars owned by car companies and shippers.

**Transit:** The total for U.S. transit includes transit rail, local motor bus as well as trolley buses, ferries and transit for the disabled. Transit rail includes commuter rail, heavy rail and light rail. The number of commuter railcars includes locomotives.

**Water:** Recreation and fishing vessels: Represent U.S. owned- and operated-vessels.

**All other vessels:** Represent U.S. flagged vessels. U.S. flagged vessels are U.S. operated but not necessarily owned.



## Number of Transportation Vehicles/Equipment—Continued

### SOURCES

#### Canada

- Air: International Civil Aviation Organization. *Civil Aircraft on Register. Digest of Statistics No. 437*. (Montréal, Que.: 1998).  
 Road: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue No. 53-215-XPB*; *Road Motor Vehicle Registrations, Catalogue No. 53-219-XPB*; and, *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).  
 Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).  
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 Water transport: Lloyd's Register of Shipping. *Statistical Tables - 1990 Table 2, and World Fleet Statistics - Table 2*, Editions 1995 and 1996. (London, UK: various years).

#### Mexico

- Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1990-1996*. (Mexico City, D.F.: 1997).  
 Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).  
 Road: Instituto Nacional de Estadística, Geografía e Informática based on data collected by the Departamento del Distrito Federal, Dirección General de Auto transporte Urbano, Direcciones de Policía y Tránsito Estatales y Municipales. (Mexico City, D.F.: various years).  
 Transit: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas. Based on data collected by the Sistema de Transporte Colectivo y Eléctrico in México City, Sistema de Transporte Eléctrico de la Zona Metropolitana in Guadalajara and Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).  
 Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

#### United States

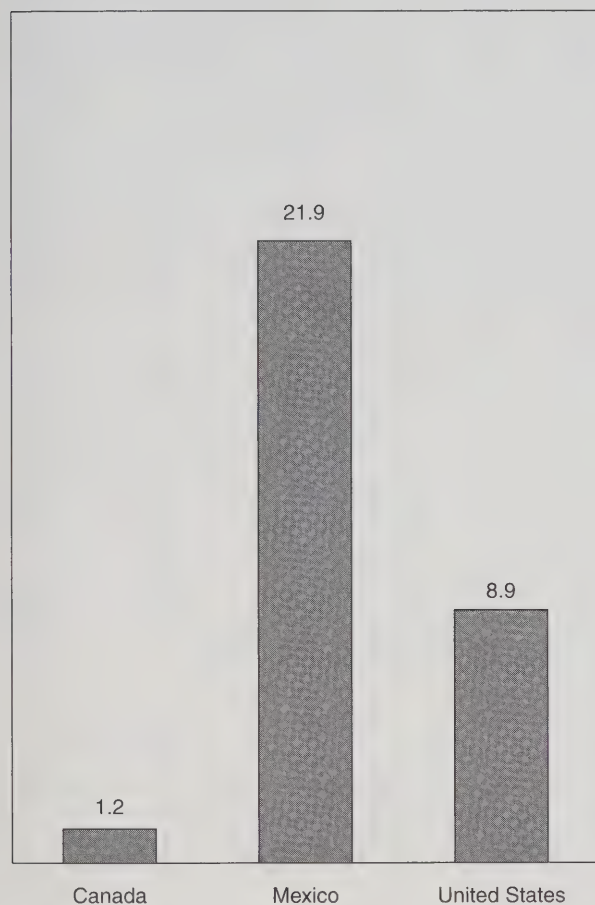
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 Road: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).  
 American Public Transit Association. *Transit Fact Book, 1996*. (Washington, DC: 1996).  
 Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997).  
 National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).  
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 U.S. Army Corps of Engineers. Navigation Data Center. *Waterborne Transportation Lines of the United States, Calendar Year 1996*. (New Orleans, LA: 1997).



**figure** 12-1a

## Growth in Number of Total Road Vehicles: 1990 to 1996

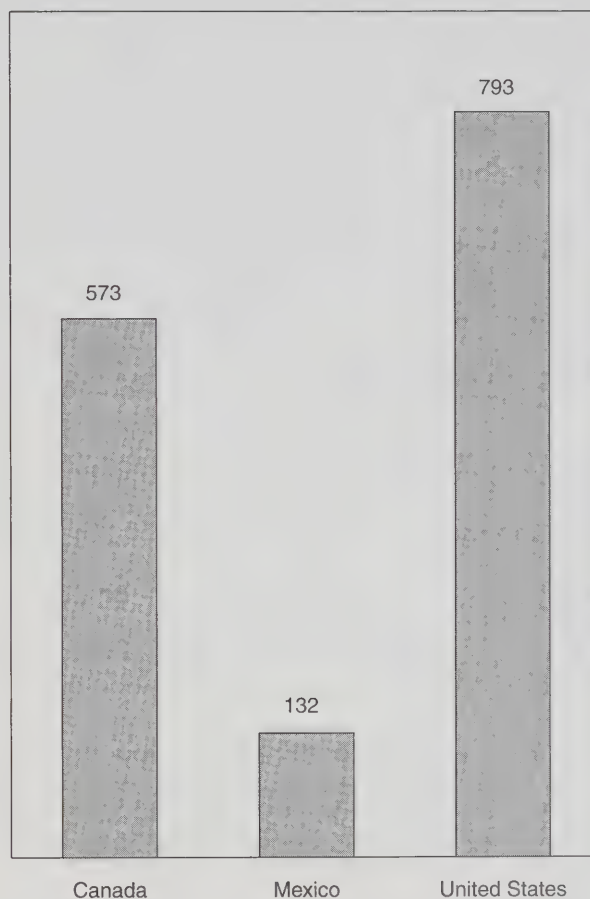
(Percent change)



Notes and sources: See Table 12-1.

**figure** 12-1b

## Total Road Vehicles per 1,000 Residents: 1996



Notes and sources: See Table 12-1 and Table 1-1.

**table 12-2**

# Vehicle-Kilometers by Mode

(Millions of vehicle-kilometers)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Air</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>14,200</b>	<b>13,600</b>	<b>13,400</b>
Air carriers	N	N	N	125	358	306	6,400	7,500	7,700
<b>Road</b>	<b>N</b>	<b><sup>e</sup>317,130</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>3,451,900</b>	<b>3,898,800</b>	<b>3,994,700</b>
Personal vehicles	N	<sup>e</sup> 271,124	N	N	N	N	3,207,400	3,601,700	3,690,100
Passenger cars	N	<sup>e</sup> 216,360	N	N	N	N	2,266,600	2,314,600	2,362,000
Motorcycles	N	<sup>e</sup> 1,044	N	N	N	N	15,400	15,800	15,900
Light trucks	N	<sup>e</sup> 53,720	N	N	N	N	925,400	1,271,400	1,312,100
Bus	1,427	1,677	1,604	N	N	N	9,200	10,300	10,500
Charter	100	135	157	N	N	N	N	N	N
Intercity	168	154	130	N	N	N	N	N	N
Local motor	769	742	716	N	N	N	3,400	3,500	3,500
School	390	646	600	N	N	N	N	N	N
Commercial freight vehicles	N	<sup>e</sup> 44,329	N	N	N	N	235,300	286,800	294,200
Single-unit trucks	N	N	N	N	N	N	83,500	100,900	103,000
Tractor	N	N	N	N	N	N	151,800	185,900	191,200
<b>Rail, train-kilometers</b>	<b>125</b>	<b>140</b>	<b>135</b>	<b>48</b>	<b>39</b>	<b>41</b>	<b>665</b>	<b>789</b>	<b>803</b>
Freight	101	119	113	27	24	26	612	737	754
Intercity passenger	24	21	22	21	15	15	53	51	48
<b>Transit</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>5,217</b>	<b>5,713</b>	<b><sup>p</sup>5,895</b>
Transit rail	N	N	N	U	U	U	1,246	1,303	1,323

**KEY:** e = Data are estimated. N = Data are nonexistent. p = Data are preliminary. U = Data are unavailable.

## NOTES

### Canada

Road, all data except bus: The number of total road vehicle kilometers for 1995 is an estimate. See Appendix B for explanation.

Bus: All bus data are from a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus and charter and other types of bus service from Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*.

Transit: Although vehicle kilometers for transit rail are nonexistent, vehicle kilometers for local motor bus are included under road, buses.

### Mexico

Air: Includes only kilometers traveled by domestic airlines under scheduled operations serving domestic and international flights.

Road: Although no data are collected for vehicle travel on all Mexican roads, the Mexican Institute of Transport (IMT) estimates that the total vehicle-kilometers for all types of passenger cars, trucks and buses using the main interurban road corridors (of which there are 10) is approximately 36 billion vehicle kilometers per year. Main interurban road corridors comprise 25,190 kilometers or approximately 5 percent of the Mexican national highway network. For additional information on main interurban road corridors and Mexico's national road network, see the Secretaría de Comunicaciones y Transportes (SCT) report, *Modernization of the Main Highway System* (Mexico City, D.F.: 1998.)

## SOURCES

### Canada

Road: Transport Canada. *Transportation in Canada 1997 - Annual Report*. (Ottawa, Ont.: 1998). Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

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# Vehicle-Kilometers by Mode—Continued

## Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

## United States

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a p p e n d i x

A

Overview of  
Transportation  
Statistics in Canada,  
Mexico and the  
United States



# appendix A

## Overview of Transportation Statistics in Canada, Mexico and the United States

### OVERVIEW OF TRANSPORTATION STATISTICS IN CANADA

#### Overview of the Canadian Statistical System

The Canadian statistical system is relatively centralized. Statistics Canada is legislated, pursuant to the *Statistics Act*, as the central agency to collect, compile, analyze and publish statistical information relating to the commercial, industrial, financial, social, economic and general activities and condition of the Canadian people. However, all federal, provincial and territorial departments and agencies maintain statistical and administrative information in support of their roles and activities.

#### Specific Sources of Canadian Transportation and Transportation Related Data and Information

In addition to Statistics Canada, other organizations identified as collecting and/or maintaining transportation-related information include: Transport Canada, Canadian Coast Guard/Department of Fisheries and Oceans, Transportation Safety Board of Canada, Pilotage Authorities, and Railway Association of Canada. The following section discusses the roles and responsibilities of these agencies and organizations. This list represents many of the Canadian sources used in this publication, but should not be viewed as exhaustive. A brief description of each organization's general mission and functions is provided as well as its specific data

activities. However, detailed information on agency data activities are not described extensively here. Additional information on specific surveys, methodologies, dissemination and other items can be found at the web sites of individual organizations described below.

#### **Statistics Canada**

Web site: [www.statcan.ca](http://www.statcan.ca)

Statistics Canada is Canada's national statistical agency, with programs organized into three broad subject matter areas: demographic and social; socio-economic; and economic. Under the *Statistics Act*, Statistics Canada is required to collect, compile, analyze, abstract and publish statistical information on virtually every aspect of Canada's society and economy.

Statistics Canada is divided into about 60 divisions, each of which is responsible for a particular activity in the collection, processing or dissemination of statistics. These divisions are grouped together into the following six fields: (1) *Business and Trade Statistics*, (2) *National Accounts and Analytical Studies*, (3) *Social, Institutional and Labor Statistics*, (4) *Informatics and Methodology*, (5) *Management Services* and (6) *Communications and Operations*. Each of these fields reports to the Chief Statistician of Canada. Many divisions function as regular producers of a particular set of data, which is why there often will be a particular subject matter division identified as the originating

source of data from Statistics Canada. Statistics are collected from different sources and in different ways. Statistics Canada data are generally produced from surveys but also can be generated as a by-product of administrative activities.

#### Business and Trade Statistics Field

The *Business and Trade Statistics Field* at Statistics Canada produces a wide range of monthly, quarterly and annual statistics on manufacturing, primary industries, transportation, communications, computing, construction, agriculture, merchandising services, external trade, prices, business finance, science and technology, small business, public finance, regional industrial structure and related areas. The *Industry Statistics Branch* and the *Prices, International Trade and Finance Statistics Branch* comprise the Business and Trade Statistics Field. The *Industry Statistics Branch* covers agriculture; transportation; distributive trades; manufacturing, construction and energy; and services. The *Prices, International Trade and Finance Statistics Branch* covers industrial organization and finance, international trade, investment and capital stock, prices, science and technology and small business and special surveys. The Transportation; International Trade; and Manufacturing, Construction and Energy divisions are major contributors to Canadian transportation data, and are described in more detail below.

Transportation Division. The Transportation Division collects, publishes and makes available statistics on air, rail, road and water transportation industries and on related traffic and infrastructures. The Transportation Division includes among its activities, the Aviation Statistics Centre, a Surface and Marine Section and a Multimodal unit. The Aviation Statistics Centre covers statistics on air carrier financial and operating statistics; air traffic at Canadian airports; volume of cargo; origin and destination of scheduled air passengers travelling within Canada,

between Canada and the United States and internationally; international and domestic air charter statistics; airport activity and traffic flow; fare type statistics; aircraft utilization.

The Surface and Marine Section and Multimodal unit cover railway financial and operating statistics, equipment and length of track, fuel consumption and employment statistics, freight and passenger traffic, freight loaded, receipts from and deliveries to U.S. rail connection, commodity movement between provinces and to and from U.S. regions, motor vehicle registrations and related licenses, gross and net sales of motor fuels. The Surface and Marine Section also includes trucking and marine units. The Trucking unit covers financial and operating statistics on motor carriers of freight; domestic, and international commodity origin-destination statistics of the Canadian domiciled for-hire trucking industry (domestic and international); private trucking statistics. The Marine unit covers financial and operating statistics on water carriers, including number and kind of vessels, employment, fuel consumption, type of service; shipping and port activities; commodities loaded and unloaded; containerized commodities; ports of loading and unloading; number, kind, operating status and registry (flag) of vessels arriving at and leaving Canadian ports; foreign port of origin, or destination.

Manufacturing, Construction and Energy Division. The Manufacturing, Construction and Energy Division conducts monthly surveys on manufacturing, forestry, construction and energy to produce a range of current indicators such as shipments or sales, inventories and orders. The division also conducts annual surveys covering manufacturing, forestry, construction, mineral fuels, pipelines and utility industries



to produce a range of cost structure, material input, commodity output and employment data.

International Trade Division. The International Trade Division is responsible for the compilation, analysis and dissemination of Canada's merchandise exports and import statistics, including mode of transportation information, and related price and volume indexes. Beginning with the year 1996, a weight variable (in kilograms or metric tons) for each commodity traded internationally became available.

#### National Accounts and Analytical Studies Field

The *National Accounts and Analytical Studies Field* at Statistics Canada is responsible for providing a set of macroeconomic series within the five complex frameworks of the Canadian System of National Accounts. It provides a broad band of research and analysis intended to animate society's perception of social and economic behavior, and undertakes research and development statistical techniques. Two branches, *Analytical Studies* and the *System of National Accounts*, comprise the *National Accounts and Analytical Studies Field*. The *Analytical Studies Branch* covers business and labor market analysis, current economic analysis, family and community support systems, microeconomic studies and analysis and social and economic studies. The *System of National Accounts Branch* covers the balance of payments, industry measures and analysis, input-output, national accounts and environment and public institutions. The Balance of Payments, Input-Output, National Accounts and Environment and Public Institution divisions are major contributors to Canadian transportation data, and are described in more detail below.

Balance of Payments Division. The Balance of Payments Division produces statistics on

transactions and positions between Canada and other countries.

Input-Output Division. The Input-Output Division develops annual input-output tables and annual labor and multifactor productivity accounts for the business sector industries in Canada, interprovincial input-output tables with trade flows on an occasional basis and structural economic models of the Canadian and Provincial economies.

National Accounts and Environment Division. The National Accounts and Environment Division is responsible for the conceptual and statistical integration of Statistics within the System of National Accounts.

Public Institutions Division. The Public Institutions Division produces statistics on the financial activities and employment of the Canadian public sector.

#### Social, Institutional and Labor Statistics Field

The *Social, Institutional and Labor Statistics Field* at Statistics Canada conducts a wide range of statistical programs dealing with virtually all aspects of the social, institutional and labor market characteristics and activities of Canadians. The field is comprised of the *Census and Demographic Statistical Branch*, the *Institutional and Social Statistics Branch* and the *Labor and Household Survey Branch*. The *Census and Demographic Statistical Branch* covers census analysis; census operations; demography; and housing, family and social statistics. The *Institutional and Social Statistics Branch* covers culture, tourism, health and the Centre for Education Statistics. The *Labor and Household Survey Branch* covers household surveys, labor and household surveys analysis, labor and special surveys. The Census Operations; Labor and Household Surveys Analysis; and Culture, Tourism and Centre for Education

Statistics divisions are major contributors to Canadian transportation data, and are described in more detail below.

Census Operations Division. The Census Operations Division is responsible for the planning, development and implementation of all production-related operations of the periodic decennial and quinquennial censuses of population, Canada's national inventory of key social-economic phenomena.

Labor and Household Surveys Analysis Division. The Labor and Household Surveys Analysis Division provides resources for the content, analysis and evaluation of income and labor market related data, including data on labor force status, occupation, labor compensation, pensions, industry, individual and family income and expenditure, for both census and sample surveys.

Culture, Tourism and the Centre for Education Statistics Division. The Culture, Tourism and the Centre for Education Statistics Division is responsible for Cultural Statistics, the Travel and Tourism Programs and Education Statistics. The Travel and Tourism Statistics Program manages two surveys: the *Canadian Travel Survey* (which measures Canadian domestic travel) and the *International Travel Survey* (which provides statistics on Canadian and Foreign international tourist movements). Statistics Canada is a major user of this information, in particular for the purpose of providing estimates of receipts and payments for the Travel Account component of the Balance of Payments. The information also is used by the National Accounts and Environment Division for the purpose of maintaining the Tourism Satellite Account, which provides a means of measuring tourism activities in relation to other economic activities in Canada. Other federal and provincial departments as well as many private-sector

business use tourism data to monitor market share and develop business strategies.

#### Informatics and Methodology Field

The *Informatics and Methodology Field* at Statistics Canada ensures that the statistical methodology used by all surveys is sound and statistically efficient, and provides leadership for and management of information processing in Statistics Canada. The field is comprised of the *Classification Systems Branch*; the *Informatics Branch* and the *Methodology Branch*. The *Classification Systems Branch* covers business register, geography, standards and tax data. The *Informatics Branch* covers informatic users services, the main computer center and systems development. The *Methodology Branch* covers business and social survey methods. The Business Register, Geography and Standards divisions are major contributors to Canadian transportation data, and are described in more detail below.

Business Register Division. The Business Register Division is responsible for the development and maintenance of a central register of firms and their constituent establishments for purposes of statistical collections.

Geography Division. The Geography Division maintains Statistics Canada's geographic classification infrastructure, develops geographic concepts and products and services for clients, including the census, and is the centre of expertise in the application of computerized geographic and cartographic techniques.

Standards Division. The Standards Division develops standard classifications, monitors their implementation and establishes official concordances between international and Canadian classifications. It standardizes economic and social concepts, and provides



a system of comprehensive documentation for all surveys conducted in Statistics Canada. The Division played an important role in the development of the Standard Industrial Classification (SIC) and more recently with the development of the North American Industrial Classification System (NAICS).

#### Management Services Field

The *Management Services Field* at Statistics Canada organizes and coordinates internal management services, including the development and implementation of all management policies and systems within the agency and the assessment of the efficiency and effectiveness of these programs.

#### Communications and Operations Field

The *Communications and Operations Field* at Statistics Canada provides a full range of external communication functions, including respondent, user and media relations. It also administers the central and regional operational functions essential to the conduct of the agency's statistical programs, including regional data collection and processing activities, marketing, publishing and electronic data dissemination. The field is comprised of the *Marketing and Information Services Branch* and the *Regional Operations Branch*. The *Marketing and Information Services Branch* is responsible for communications, dissemination and marketing. The *Regional Operations Branch* is responsible for advisory services and survey operations. The *Advisory Services Division* provides an information dissemination network across the country through nine regional Reference Centres. Each Reference Centre has a collection of current publications and reference documents that provide customized output and analysis for a fee. The location of the regional reference centres can be found in all Statistics Canada publications,

or at the Statistics Canada web site: [www.statcan.ca/english/reference/Refcentre/refdoc.html](http://www.statcan.ca/english/reference/Refcentre/refdoc.html)

#### ***Transport Canada***

Web site: [www.tc.gc.ca](http://www.tc.gc.ca)

Transport Canada has traditionally played a key role in delivering a safe and efficient transportation system. With passage of the new *Canada Transportation Act* in 1996, the Department has implemented a number of changes, including commercializing many of its operational activities, overhauling transportation policy, streamlining regulations, reducing subsidies and cutting overhead. The role of the new Transport Canada is focused on the development of relevant transportation policies and legislation and maintenance of a high level of safety and security. The department of the future will no longer own, operate or subsidize large parts of the transportation system. The following sections highlight the areas in Transport Canada that collect, develop or maintain transportation statistics.

#### Policy Group

The *Policy Group* at Transport Canada is responsible for setting policies relating to trade and to rail, marine, motor carrier and air transportation; setting departmental strategic policy; assessing the performance of the overall transportation system and its components; and developing supporting information. Within the *Policy Group*, the *Economic Analysis Directorate* is responsible for meeting most of the statistical needs of the *Policy Group* and of Transport Canada.

The *Economic Analysis Directorate* meets these needs by identifying available data sources, such as Statistics Canada and other federal and provincial departments and agencies, implementing regulations to collect

required data not available through other sources, initiating new surveys and other instruments to collect required data, purchasing information from recognized experts and identifying available data from other sources such as international organizations. The *Economic Analysis Directorate* also produces short, medium and long-term forecasts of aircraft traffic, marine and surface commodity flows and vessel movements.

### Safety and Security Group

The *Safety and Security Group* at Transport Canada is responsible for establishing and administering regulations and standards necessary for the safe conduct of Canadian civil aviation; monitoring the operation of NavCanada (the not-for-profit corporation whose primary mission is the safe, efficient and effective delivery of air navigation services); developing and enforcing marine regulations; and developing and enforcing the regulatory aspects of rail safety, the transport of dangerous goods, and motor vehicle and motor carrier safety and motor vehicle emissions.

Within the *Safety and Security Group*, the *Road Safety Directorate* collects, in cooperation with the Canadian Council of Motor Transport Administrators (CCMTA), motor vehicle traffic collision statistics from Canada's provincial and territorial jurisdictions. These statistics are stored in the Directorate's *Canadian Traffic Accident Information Database* (TRAID), and are published on an annual basis in a brochure entitled *Canadian Motor Vehicle Traffic Collision Statistics*, TP 3322. The *Road Safety Directorate* also provides to Natural Resources Canada, for publication in its annual *Motor Vehicle Fuel Consumption Guide*, fuel consumption ratings of new motor vehicles. The fuel consumption ratings are

submitted to Transport Canada by motor vehicle manufacturers who certify that the tests and calculations were carried out in accordance with approved Transport Canada methods.

The *Transport Dangerous Goods Directorate* also is part of the *Safety and Security Group*. Transport Canada is the focal point for the national program to promote public safety during the transportation of dangerous goods. The *Transport Dangerous Goods Directorate* serves as the major source of regulatory development, information and guidance on dangerous goods transport for the general public, industry and government. Through its various components, the Directorate works closely with other federal and provincial agencies to implement the safety program. The *Transport Dangerous Goods Directorate* maintains a *Dangerous Goods Accident Information System* (DGAIS), which contains over 100 elements of information for each accident involving dangerous goods reported to the directorate. Access to previous year's data is made possible by Statistics Canada.

In addition to these activities, the Canadian Transport Emergency Centre (CANUTEC) also is part of the *Transport Dangerous Goods Directorate*. The CANUTEC is a national bilingual advisory centre, which was established in 1979, and is operated by Transport Canada to assist emergency response personnel in handling dangerous goods emergencies. The CANUTEC has established a scientific information holding on chemicals manufactured, stored and transported in Canada. This holding consists of several data banks and includes Material Safety Data Sheets (MSDS) on more than 500,000 commercial products. The CANUTEC is staffed with professional scientists specialising in emergency response and



experienced in interpreting technical information and providing advice. The CANUTEC has participated in a continental effort to consolidate the interpretations into an easy to use manual: *The 1996 North American Emergency Response Guidebook*. This guidebook provides information for the initial response to accidents involving any of the 3,000 categories of dangerous goods (this covers all of approximately 500,000 hazardous commercial products transported in Canada). More information on the CANUTEC can be found at their web site: [www.tc.gc.ca/canutec/en/menu.htm](http://www.tc.gc.ca/canutec/en/menu.htm)

## **Other Canadian Federal Agencies**

### ***Transportation Safety Board of Canada***

Web site: [www.tsb.gc.ca](http://www.tsb.gc.ca)

The Transportation Safety Board of Canada was established as an independent board in 1990. The agency is concerned with the analysis of safety failures in the federally regulated elements of the marine, rail, pipeline and air transportation systems.

As part of its strategy to advance transportation safety, the Board produces, on an annual basis, modal publications (air, rail, water) reporting on the numbers of modal accidents, incidents, fatalities and injuries that have been reported to the Transportation Safety Board for the calendar year. The Board also makes use of information technologies, such as the Internet, to make safety information more readily available to industry and the public.

### ***Pilotage Authorities***

The *Pilotage Act*, proclaimed in force February 1, 1972, created four pilotage regions with specific authorities. The four Pilotage Authorities (Atlantic, Laurentian, Great Lakes and Pacific) are Crown

Corporations and are responsible to the Canadian Parliament through the Minister of Transport. The role of each of these Pilotage Authorities is to establish, operate, maintain and administer, in the interest of safety, an efficient and economical pilotage service within their geographical boundaries. Each authority submits, through the Minister of Transport, an Annual Report to Parliament. These annual reports include financial statements concerning the respective authority's activities for the past year, as well as historical operating statistics indicating the average number of pilots and pilotage assignments, by compulsory pilotage area. Below are the web sites of the four pilotage regions.

Atlantic Pilotage Authority:

Web site: [www.canada.gc.ca/depts/agencies/apaind\\_e.html](http://www.canada.gc.ca/depts/agencies/apaind_e.html)

Great Lakes Pilotage Authority:

Web site: [www.canada.gc.ca/depts/agencies/glpind\\_e.html](http://www.canada.gc.ca/depts/agencies/glpind_e.html)

Laurentian Pilotage Authority:

Web site: [www.canada.gc.ca/depts/agencies/lpaind\\_e.html](http://www.canada.gc.ca/depts/agencies/lpaind_e.html)

Pacific Pilotage Authority:

Web site: [www.canada.gc.ca/depts/agencies/ppaind\\_e.html](http://www.canada.gc.ca/depts/agencies/ppaind_e.html)

### ***St. Lawrence Seaway Management Corporation***

Web site: [www.seaway.ca](http://www.seaway.ca)

The St. Lawrence Seaway Management Corporation operates the St. Lawrence Seaway in conjunction with the U.S. St. Lawrence Development Corporation. The two organizations produce, on an annual basis, *The St. Lawrence Seaway Traffic Report*, a

statistical publication detailing marine transport activity on the St. Lawrence Seaway. Information concerning the St. Lawrence Seaway Management Corporation also is readily available from its Annual Report(s) and from its web site.

***Canadian Coast Guard, Department of Fisheries and Oceans***

Web site: [www.ccg-gcc.gc.ca](http://www.ccg-gcc.gc.ca)

The Canadian Coast Guard's mandate is focused on sustainable ocean management that permits a safe, environmentally sustainable marine transportation system. It advances the ocean mandate both through its internal partnership with Department of Fisheries and Oceans sector counterparts and through its primary role of ensuring safe and environmentally responsible use of Canada's waterways. The Canadian Coast Guard organization splits into five business lines, which include marine navigation services; marine communications and traffic services; ice-breaking operations; rescue, safety and environmental response activities; and fleet management.

***Marine Atlantic Inc.***

Web site: [www.marine-atlantic.ca](http://www.marine-atlantic.ca)

Marine Atlantic Inc. is a federal Crown corporation, and its mission is to provide quality, safe and efficient transportation and hospitality services. It has a single mandate, the constitutional year-round ferry service linking Port aux Basques, Newfoundland, and North Sydney, Nova Scotia and the seasonal alternative ferry service between North Sydney and Argentina, Newfoundland. Information concerning Marine Atlantic's ferry services, including operational, financial and traffic information, is available from its Annual Report and on its web site.

***Natural Resources Canada***

Web site: [www.NRCan.gc.ca](http://www.NRCan.gc.ca)

The Energy Sector at Natural Resources Canada promotes the sustainable development and safe and efficient use of Canada's energy resources. The Energy Sector also provides technical knowledge and advice to the energy industry and to government. Its knowledge base helps the Canadian government create policies, implement regulations, meet international commitments and enhance job creation and economic growth.

***Nongovernment Organizations and Associations***

This list represents selected nongovernmental organizations and associations that were used as Canadian resources for this publication. This list should *not* be viewed as an exhaustive list of nongovernmental organizations and associations that maintain and analyze transportation and transportation related data for Canada. A brief description of each organization's general mission and functions is provided as well as its specific data activities.

***NAV CANADA***

Web site: [www.navcanada.ca](http://www.navcanada.ca)

NAV CANADA is the country's wholly private, not-for-profit provider of civil air navigation services (ANS). From over 130 facilities coast to coast, including Area Control Centers, Air Traffic Control Towers, Flights Service Stations and a network of electronic navigation aids, NAV CANADA delivers air traffic control flight information, and airport advisory services to the regional, national and international air transport communities and general aviation. NAV CANADA provides aircraft movement statistics that it records at Canada's airports to Transport Canada and the Aviation Statistics Center of Statistics Canada, for publication on an annual basis

in their joint publication, *Aircraft Movements Statistics*, TP 577.

NAV CANADA also provides aircraft movement statistics it records at Canada's national airports to the Economic Analysis Directorate of Transport Canada. These statistics are used by Transport Canada to make forecasts, on a contractual basis with the national airports, of future aircraft movement volumes that the airport authorities use to plan their airport's future facility requirements. NAV CANADA also produces periodic publications that provide information relating to the Air Navigation System, as well as annual reports that provide a financial profile of its organization.

### ***Railway Association of Canada***

Web site: [www.railcan.ca/](http://www.railcan.ca/)

The Railway Association of Canada (RAC) is the industry association of freight, passenger and commuter railways that operate throughout Canada. Operating, financial and traffic information are available from the RAC web site and from their annual statistical report "Railway Trends." The RAC web site also identifies member railway companies and has links to the web site of member railways and the Transportation Safety Board of Canada.



<b>Transportation statistical subject</b>	<b>Canadian sources for data and analysis</b>
Country Overview	Statistics Canada
Transportation and the Economy	Statistics Canada and Transport Canada
Transportation Safety	Air: Transportation Safety Board of Canada and Transport Canada Road: Transport Canada and Statistics Canada Pipeline: Transportation Safety Board of Canada Rail: Transportation Safety Board of Canada Water: Transportation Safety Board of Canada and Canadian Red Cross
Transportation, Energy and the Environment	Natural Resources Canada, Transport Canada and Statistics Canada
Domestic Freight Activity	Air: Statistics Canada Water: Statistics Canada and Transport Canada Pipeline: Statistics Canada Road: Statistics Canada Rail: Transport Canada and Statistics Canada
North American Merchandise Trade	Statistics Canada
International Merchandise Trade Between North America and the Rest of the World	Statistics Canada
Domestic Passenger Travel	Air: Statistics Canada Road: Statistics Canada and Transport Canada Transit: Statistics Canada Rail: Statistics Canada
North American Passenger Travel	Statistics Canada
International Passenger Travel Between North America and the Rest of the World	Statistics Canada
Transportation Infrastructure	Air: Natural Resources Canada and Transport Canada Water: Transport Canada and Statistics Canada Pipeline: Statistics Canada Road: Transportation Association of Canada and Transport Canada Rail: Statistics Canada
Transportation Vehicles	Air: International Civil Aviation Organization Water: Lloyds Register of Shipping Road: Statistics Canada and Transport Canada Transit: Statistics Canada Rail: Statistics Canada



## OVERVIEW OF TRANSPORTATION STATISTICS IN MEXICO

### Overview of the Mexican Statistical System

The Instituto Nacional de Estadística, Geografía e Informática (INEGI or the National Institute of Statistics, Geography and Informatics) is the only federal agency in Mexico whose main responsibility is to gather, process, create, compile and disseminate statistical information on a wide variety of social and economic issues. INEGI receives its authority from the Ley de Información Estadística y Geográfica (Statistical and Geographic Information Act). In compliance with the *Statistical and Geographic Information Act*, INEGI is responsible for the coordination of the national statistical system and the national system on geography information, as well.

### Specific Sources of Mexican Transportation and Transportation Related Data and Information

In addition to INEGI, many federal agencies and institutions also gather, process, create, compile and disseminate statistics on transportation. These statistics are based on census projects, surveys by sampling and administrative records. In addition to these federal sources, many state and municipal governments also generate different types of statistical information, in support of their missions and as a by-product of specific administrative functions. A brief description of each organization's general mission and functions is provided as well as its specific data activities. However, detailed information on agency data activities are not described extensively here. Additional information can be found at the web sites of individual organizations described below.

### *Instituto Nacional de Estadística, Geografía e Informática (INEGI)*

#### *National Institute of Statistics, Geography and Informatics*

Web site: [www.inegi.gob.mx](http://www.inegi.gob.mx)

INEGI's mandate includes statistics, geography and informatics (information technology). INEGI's Statistical Directorate is responsible for providing a wide range of information to the public. To achieve this mission, social, demographic and economic statistics are collected, processed and disseminated. Data are collected through population, economic and agricultural censuses; industry and activity specific surveys (for example: construction, employment, trade, and income and expenditure of households, amongst others); administrative records; and the national accounting system (which in turn, utilizes basic statistics generated by the INEGI and other institutions). To perform these data collection activities, INEGI relies upon 80 central sources and 60 local sources located throughout Mexico and within each of the country's states. INEGI disseminates all of its information through printed items and electronic materials, such as diskettes, CDs and the Internet

In terms of transportation statistics, INEGI mainly generates information through quinquennial census data, and through the annual data from Mexico's National Account System. Statistics on transportation and related issues also are produced or gathered through other INEGI projects. This is the case of data for vehicle registrations, traffic accidents, transportation characteristics for different modes of transportation.

Among other responsibilities, INEGI also must provide the geographical information that Mexico requires for the planning and optimal use of territorial resources. At present, this is done in digital format through the Sistema Nacional sobre Información Geográfica (National System on Geographical Information).

### ***Secretaría de Comunicaciones y Transportes (SCT)***

#### ***Ministry of Communications and Transportation***

Web site: [www.sct.gob.mx](http://www.sct.gob.mx)

The Secretaría de Comunicaciones y Transportes is responsible for the development of a modern, efficient and sufficient transportation and communication infrastructure that supports sustainable and sound economic growth in Mexico, and that promotes the improvement and broadening of efficient and high quality transportation and communication services. Within SCT, specific program areas are responsible for transportation, generally, and transportation statistics and information, specifically. These program areas are described below.

#### Coordinación General de Puertos y Marina Mercante (CGPMM)

##### General Coordination of Ports and Merchant Marine

The CGPMM is responsible for the establishment and implementation of policies, standards, systems and procedures for maritime and port activities that encourage the development of this transportation mode and port operations. This area provides statistical information about maritime and port activity, including data that describe the infrastructure and movement of freight shipments and passengers. The CGPMM *Anuario Estadístico: Movimiento de Carga,*

*Pasajeros y Buques* (Statistical Yearbook: Movement of Shipments, Passengers and Vessels)

#### Dirección General de Puertos (DGP)

##### General Directorate of Ports

The DGP oversees the administration of concessions for Mexico's port administrations. This includes oversight concessions of specific facilities and their use, optimization, construction, operation and use of public property and the negotiation for the extension, amendment, annulment, recovery or early termination of a concession. The DGP also administers and oversees the construction, operation and use of goods at ports, terminals, marine and port facilities not under concession, and resolves any complaints that may be filed because of public bidding for concessions or agreements set forth by the (Ports Act) Ley de Puertos. In terms of statistics, this area gathers and publishes the data on individual ports, including ports' real estate registries (which provide a description of physical facilities of a port and associated bodies of water). It also publishes a statistical report, *Los Puertos Mexicanos en Cifras* (Mexican Ports in Figures), with information about port infrastructure, shipments, passenger and container activity, and dredging volumes.

#### Dirección General de Capitanías (DGC)

##### General Directorate of Port Authorities

The DGC coordinates and regulates the tasks performed by Mexico's Port Authorities (Capitanías de Puerto) and the relative delegations under their jurisdiction. It also provides oversight of the operations of the Port Authorities, and their correspondence with the applicable legal regulations. It also serves as the liaison office for the communication and coordination among

other SCT offices relating to maritime transportation, including the Dirección General de Puertos, the Dirección General de Marina Mercante, the Capitanías de Puerto and other SCT offices and divisions. The DGC performs a followup and evaluation of the results of port and maritime activities. It also is responsible for providing the Harbour Masters with information about pertinent legal, operational, and technical regulations. In terms of statistics, the DGC designs software for the adequate control of port and maritime information and compiles statistics and a data bank on maritime and port operations.

#### Dirección General de Marina Mercante (DGMM)

##### General Directorate of Merchant Marine

The DGMM is responsible for the regulation, promotion, coordination and control of the Mexican merchant marine. In this capacity, it manages, coordinates and controls the *Registro Publico Marítimo Nacional* (National Maritime Public Registry) and the *Programa de Abanderamiento* (National Flag Vessel Registration). The DGMM registers and grants licenses to national flag vessels and Mexican naval vessels and equipment. In addition, the directorate compiles a *Anuario Estadístico del Sector Marítimo* (Statistical Yearbook of the Maritime Sector), which contains data on the navigation of ships and an inventory of maritime signaling.

#### Administraciones Portuarias Integrales (API)

##### Integrated Port Administrations

The APIs are generally public/private enterprises responsible for the management of 22 of Mexico's maritime ports. Of the current 22 APIs, 15 of these have a majority share from the Mexican Federal Government, 5 are under the control of state governments (Baja California Sur, Campeche, Quintana Roo,

Tabasco and Tamaulipas), 1 is completely private (Acapulco) and one is under the control of a Trust Fund (Cabo San Lucas). In addition to port management, the APIs maintain information about cargo and passenger activity and vessel entrances and clearances.

#### Aeropuertos y Servicios Auxiliares (ASA)

##### Airports and Auxiliary Services

Web site: [www.asa.org.mx](http://www.asa.org.mx)

This organization's responsibilities include administrating, operating, modernizing, building and maintaining Mexico's airport network, as well as raising security levels and increasing the network's stability and efficiency.

ASA administers 58 airports, 9 of which have been concessioned and sold to the private sector since 1998. ASA produces statistics that cover passenger, freight and mail activity in national and international civil aviation; income per service and operating costs; and a log of airport operations.

#### Caminos y Puentes Federales de Ingresos y Servicios Conexos (CAPUFE)

##### Federal Roads and Bridges and Related Services

Web site: [www.capufe.gob.mx](http://www.capufe.gob.mx)

CAPUFE is a decentralized federal agency that is in charge of the management, operation, conservation, rehabilitation, expansion, modernization and construction of roads and toll bridges. As part of its responsibilities, CAPUFE also generates statistics based on the vehicle registry that is taken at toll roads and bridges under its management. It also compiles organizational income and expense data.



## Dirección General de Aeronáutica Civil (DGAC)

### General Directorate of Civil Aeronautics

This DGAC is responsible for the standards design, coordination and surveillance of national and international air public transportation services, and of auxiliary and related services and their facilities, and for the safety oversight of these services. It also is responsible for determining the necessary arrangements for concessions, permits and authorizations to provide air carrier and private general aviation transportation services. In terms of statistics, the DGAC is responsible for conducting and publishing studies, statistics and operational, financial and occupational data on passenger and freight transportation by the commercial air carriers, and the compilation of information about aviation accidents and incidents.

## Dirección General de Autotransporte Federal (DGAF)

### General Directorate of Federal Motor Carriers

The DGAF is responsible for the regulation, standards design, surveillance and sanctioning of public and private motor carrier services operating on roads under federal jurisdiction. It also is responsible for the design of the operational systems for the motor carrier services. The directorate generates statistics on the number of motor carrier companies and their vehicle fleets and the infrastructure related to such services.

## Dirección General de Planeación (DGP)

### General Directorate of Planning

The DGP is responsible for developing the objectives, strategies and guidelines for the transportation sector. It works to establish the effective steps and goals according to transportation policies and is involved in

developing the necessary planning tools to support these. The DGP also produces a cartography of the transport sector, publishes maps with infrastructure data, road maps and other graphical documents. In terms of transportation statistics, this area is responsible for compiling and publishing the *Anuario Estadístico del Sector Comunicaciones y Transportes* (Annual Statistical Report on the Communications and Transportation Sector). This report offers users a statistical compendium with the most relevant data on variables and basic indicators for all modes of transportation.

## Dirección General de Policía Federal de Caminos y Puertos (DGPFCP)

### General Directorate of Federal Highway and Ports Patrol

The mission of this directorate is to supervise, keep order and guarantee public safety on roads that are under federal jurisdiction. In terms of transportation statistics, the DGPFCP generates data on motor vehicle crashes, robberies and people arrested on roads under federal jurisdiction. Until the end of October 1999, this agency was part of SCT. After this time, it became part of the Secretaría de Gobernación (Ministry of Interior and Governmental Affairs).

## Dirección General de Protección y Medicina Preventiva en el Transporte (DGPMPT)

### General Directorate of Protection and Preventive Medicine in Transport

The basic task of the DGPMPT is to determine the physiological conditions that personnel involved in the operation of different modes of transportation and related services must meet, and to document the medical history of such personnel. In terms of statistics, the DGPMPT keeps administrative records on



medical and physiological exams, and toxicological tests conducted to decrease occupational hazards and accidents when providing transport services.

Dirección General de Servicios Técnicos (DGST)

General Directorate of Technical Services

In support of highway planning, the DGST conducts studies and performs and develops road programs for the construction, modernization and expansion of free (nontoll) highway traffic routes, toll roads and highways under concession. Through field surveys, it gathers data on the origin-destination, weights and dimensions of motor carriers and traffic volume on Mexico's national road network. In addition, the DGST creates and keeps an updated national inventory of infrastructure works.

Dirección General de Tarifas, Transporte Ferroviario y Multimodal (DGTTFM)

General Directorate of Rates, Railroad and Multimodal Transportation

The basic task of this unit is the definition of general principles for rate regulations of air, road and railway transportation services, and of the services offered and performed in ground and airport federal areas. The DGTTFM also is responsible for the coordination, regulation, control and sanctioning of services provided within the railway and multimodal transportation services, except for operational systems. In addition, because of the separation of several railroad lines from Mexico's national rail system, this unit is responsible for the gathering of data on railroad transportation, a task previously undertaken by the National Railroads of Mexico (Ferrocarriles Nacionales de México) prior to 1997.

Ferrocarriles Nacionales de México (FNM)

National Railroads of Mexico

The FNM is responsible for ensuring a safe, efficient and competitive railway system to help satisfy economic needs and establish closer ties between international and national markets. Due to the privatization of some lines of the (National Railway System) Sistema Ferroviario Nacional, since 1998 this agency only records statistical information for the Southeast Railways (Ferrocarril del Sureste) and short line railroads still under its control. (Prior to 1998, the FNM was responsible for statistical information for all of Mexico's railroads).

Instituto Mexicano del Transporte (IMT)

Mexican Institute of Transport

Web site: [www.imt.mx](http://www.imt.mx)

IMT is a technological research and development center under SCT. IMT was created in response to the need for modernizing infrastructure, optimizing operations, developing or adapting technologies according to the country's needs and promoting national industrial production. As part of its organizational mandate, IMT conducts research projects in the area of public and private transport. In addition, the Institute has several programs that are aimed at developing adequate human capital, through education and training, for the transportation sector.

IMT compiles and disseminates an annual *Manuel Estadístico del Sector Transporte* (Statistical Manual for the Transport Sector.) This publication includes official transportation and transportation related statistics for all modes of transport. The manual aims to offer those interested in the subject an overall perspective on the evolution of multimodal and intermodal

transport in Mexico. Similarly, the IMT collaborates with SCT's Dirección General de Servicios Técnicos (Technical Services Directorate) to develop field surveys on the origin, destination, weight and size of road freight transport vehicles. IMT also processes this field data and publishes statistics periodically. This annual survey is known as the *Estudio Estadístico de Campo del Autotransporte Nacional* (Field Statistics Study of National Auto Transport).

#### Servicios a la Navegación en el Espacio Aéreo Mexicano (SENEAM)

##### Navigation Services in Mexican Air Space

Web site: [www.sct.gob.mx/estructura/seneam.htm/](http://www.sct.gob.mx/estructura/seneam.htm/)

SENEAM provides air traffic control services, aeronautical meteorology, radio-aided navigation, aeronautical telecommunications, airplane dispatching, aeronautical information, operational messages, administrative services of any kind required by companies, government offices, agencies or individuals in national and international air transport activities, and all services necessary to guaranty safety, order and a smooth traffic flow. SENEAM also generates statistical information on infrastructure, equipment, operation and support services for air navigation, as well as writing, updating and distributing the *Publicación de Información Aeronáutica* (Aeronautical Information Publication).

#### Unidad de Autopistas de Cuota (UAC)

##### Toll Highway Unit

The UAC is responsible for permits and authorizations for the construction of road access, crossings and facilities for Mexico's toll roads. The unit is also in charge of recording the fees being collected at toll roads and bridges. In terms of statistics, this office

gathers data on all vehicles that travel on toll roads and bridges and conducts statistical analysis and operational evaluations. In its statistical analysis, the UAC includes data from the Caminos y Puentes Federales de Ingresos y Servicios Conexos (Federal Roads and Bridges and Related Services) in calculating the levels of vehicle traffic. These data are measured in annual and monthly average daily traffic.

#### **Other Mexican Federal Agencies**

##### ***Banco de Mexico, BANXICO***

##### ***Bank of Mexico***

Web site: [www.banxico.org.mx](http://www.banxico.org.mx)

BANXICO's chief purpose is to supply national currency to the country's economy. In achieving this goal, the central bank's primary objective is to maintain the stability of the currency's purchasing power. The bank also helps promote the development of the financial system and ensures a smooth functioning of payment systems. In coordination with other organizations, BANXICO is responsible for compiling, analyzing and publishing economic and financial statistics. In terms of transportation statistics, BANXICO generates data on tourism flows, differentiating between tourists that enter or leave the country by land or by air.

##### ***Comisión Nacional para el Ahorro de Energía, CONAE***

##### ***National Commission for Energy Conservation***

Web site: [www.conae.gob.mx](http://www.conae.gob.mx)

The Commission serves as a technical consulting agency on energy conservation and efficiency for federal agencies and entities, state and municipal governments, and individuals. The Commission is comprised of representatives from several

other federal Ministries. CONAE is responsible for promoting energy conservation across all sectors of the Mexican society and economy. Specifically, CONAE's most important functions are promoting, coordinating and evaluating strategies; programs and action on energy conservation and efficiency; and developing and disseminating research, technologies and studies to support these objectives.

### ***Comisión Reguladora de Energía, CRE***

#### ***Energy Regulation Commission***

Web site: [www.cre.gob.mx](http://www.cre.gob.mx)

The mission of the CRE is to promote efficient development of the gas and electrical energy sectors for the benefit of users. To meet this objective, the Commission regulates the electric and natural gas industries in Mexico. The activities regulated and defined in the *Ley de la CRE* (CRE Act) are generating, operating, transforming, marketing and supplying electrical energy, as well as regulating the transport, storage and distribution of petroleum and natural gas.

### ***Instituto Nacional de Ecología, INE***

#### ***National Institute of Ecology***

Web site: [www.ine.gob.mx](http://www.ine.gob.mx)

The INE is part of the Secretaría de Medio Ambiente, Recursos Naturales y Pesca (Ministry of the Environment, Natural Resources and Fisheries), and is responsible for developing environmental policies and applying different provisions for regulating and managing the environment. Its responsibilities cover both sectoral as well as regional subjects. Because of the impact that transportation has on the environment, INE also engages in transportation related activities and projects. Among these are: determining standards for the maximum

allowable levels for automotive vehicle emissions; carrying out emissions inventories of the atmosphere by sector and greenhouse effect gases; evaluating the environmental impact for building and operating general transport routes (roadways, railways, airports, etc.); establishing air quality monitoring networks; and gathering information from these activities.

### ***Instituto Nacional de Migración, INM***

#### ***National Institute of Migration***

The INM is part of the Secretaría de Gobernación (Ministry of Interior and Governmental Affairs,) and is in charge of planning, executing, controlling, supervising and evaluating migratory services, as well as coordinating with other federal agencies that also have responsibilities in the area of migration. INM documents and registers the entrance and exit of nationals and foreigners by land, air or maritime routes. Statistical information is generated according to concepts established in the *Ley General de Población* (General Population Act) and is provided monthly to the Bank of Mexico to determine figures for tourist income and expenditures.

### ***Petróleos Mexicanos, PEMEX***

#### ***Mexican Petroleum Company***

Web site: [www.pemex.org.mx](http://www.pemex.org.mx)

PEMEX is a public, decentralized agency that is responsible for the exploration and exploitation of hydrocarbons and the production, storage, distribution and commercializing of petroleum and petrochemical products in Mexico. The agency generates a wide array of information on these activities.



***Secretaría de Comercio y Fomento Industrial, SECOFI***

***Ministry of Trade and Industrial Development***

Web site: [www.secofi.gob.mx/](http://www.secofi.gob.mx/)

The Secretaría de Comercio y Fomento Industrial is a federal executive agency that has as its mission the following functions: formulating and developing general policies in the areas of industry, mining, international trade, domestic trade and supply; regulating, directing and estimating consumer protection measures; registering industrial property and commercial ownership; overseeing and regulating foreign investment in Mexico; overseeing and regulating technology transfer and promoting and organizing industry and technology development. In regard to transportation statistics, SECOFI disseminates information on Mexico's merchandise trade by mode of transportation.

***Secretaría de Energía, SE***

***Ministry of Energy***

Web site: [www.energia.gob.mx/](http://www.energia.gob.mx/)

The Secretaría de Energía has, as its principal functions, the following: developing Mexico's national energy policies; promoting Mexico's use of hydrocarbon and nuclear energy, carrying out energy planning and setting the economic and social policies for the sector's state government enterprises, accomplishing and promoting research on energy costs and savings and issuing official energy standards for Mexico. In terms of transportation statistics, the SE develops and provides information on Mexico's energy balance, and other energy related indicators.

***Secretaría de Hacienda y Crédito Público, SHCP***

***Ministry of Finance and Public Credit***

Web site: [www.shcp.gob.mx/index.html](http://www.shcp.gob.mx/index.html)

The Secretaría de Hacienda y Crédito Público is responsible for projecting and coordinating national development planning with the participation of interested social groups; coordinating and developing the national statistical and geographic information services; and establishing standards and procedures for the organization, functioning and coordination of the national statistical and geographic information systems, including coordinating the information services of federal agencies and organizations. The Dirección General de Aduanas (General Directorate of Customs; or Customs Service) is an agency of the SHCP. The Dirección General de Aduanas has as its responsibilities some of the following: promoting programs and activities in order to implement legislative policies relating to Customs; preventing financial offences and crimes; developing, promoting and evaluating the specific systems, methods and procedures of the Customs Service, including the collection of statistical information on international trade.

***Secretaría de Programación y Presupuesto, SPP***

***(Former) Ministry of Planning and Budgeting***

The functions and responsibilities of the Secretaría de Programación y Presupuesto (SPP) were transferred to the Secretaría de Hacienda y Crédito Público in the first trimester of 1992.



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***Secretaría de Turismo, SECTUR***

***Ministry of Tourism***

Web site: [mexico-travel.com](http://mexico-travel.com)

SECTUR is responsible for formulating and managing policy on the development of national tourist activities; formulating and disseminating official information

concerning tourism; coordinating tourism advertising that is disseminated by various Federal Government agencies, state and municipal authorities, and social and private sectors; and compiling statistics on tourism, according to provisions set forth by the Secretaría de Hacienda y Crédito Público (Ministry of the Finance and Public Credit).

<b>Transportation statistical subject</b>	<b>Mexican sources for data and analysis</b>
Country Overview	Instituto Nacional de Estadística, Geografía e Informática
Transportation and the Economy	Instituto Nacional de Estadística, Geografía e Informática Banco de México Secretaría de Hacienda y Crédito Público Secretaría de Programación y Presupuesto
Transportation Safety	Air: Secretaría de Comunicaciones y Transportes Dirección General de Aeronáutica Civil Road: Instituto Nacional de Estadística, Geografía e Informática and Secretaría de Comunicaciones y Transportes (Dirección General de Policía Federal de Caminos y Puertos) Pipeline: Petróleos Mexicanos Transit: Instituto Nacional de Estadística, Geografía e Informática Rail: Instituto Nacional de Estadística, Geografía e Informática and Secretaría de Comunicaciones y Transportes (Ferrocarriles Nacionales de México) Water: Secretaría de Comunicaciones y Transportes (Coordinación General de Puertos y Marina Mercante)
Transportation, Energy and the Environment	Secretaría de Energía, Comisión Nacional para el Ahorro de Energía Comisión Reguladora de Energía Secretaría de Medio Ambiente, Recursos Naturales y Pesca Instituto Nacional de Ecología
Domestic Freight Activity	Air: Secretaría de Comunicaciones y Transportes (Aeropuertos y Servicios Auxiliares and Dirección General de Aeronáutica Civil) Road: Secretaría de Comunicaciones y Transportes (Dirección General de Autotransporte Federal, Caminos y Puentes Federales de Ingresos y Servicios Conexos, and Instituto Mexicano del Transporte) Pipeline: Petróleos Mexicanos Rail: Secretaría de Comunicaciones y Transportes (Ferrocarriles Nacionales de México) Water: Secretaría de Comunicaciones y

Domestic Freight Activity—*Continued*

North American Merchandise Trade

International Merchandise Trade Between  
North America and the Rest of the World

Domestic Passenger Travel

North American Passenger Travel

Transportes (Coordinación General de  
Puertos y Marina Mercante and Dirección  
General de Puertos)

Instituto Nacional de Estadística, Geografía  
e Informática,  
Secretaría de Comunicaciones y Transportes  
(Dirección General de Aeronáutica Civil,  
Coordinación General de Puertos y Marina  
Mercante,  
Ferrocarriles Nacionales de México, and  
Instituto Mexicano del Transporte  
Secretaría de Hacienda y Crédito Público,  
Secretaría de Comercio y Fomento Industrial  
Banco de México

Instituto Nacional de Estadística, Geografía  
e Informática,  
Secretaría de Comunicaciones y Transportes  
(Dirección General de Aeronáutica Civil,  
Coordinación General de Puertos y Marina  
Mercante,  
Ferrocarriles Nacionales de México, and Instituto  
Mexicano del Transporte  
Secretaría de Hacienda y Crédito Público,  
Secretaría de Comercio y Fomento Industrial  
Banco de México

Air: Secretaría de Comunicaciones y Transportes  
(Dirección General de Aeronáutica Civil and  
Instituto Mexicano del Transporte)  
Road: Secretaría de Comunicaciones y Transportes  
(Dirección General de Autotransporte Federal and  
Caminos y Puentes Federales de Ingresos y  
Servicios Conexos)  
Rail: Secretaría de Comunicaciones y Transportes  
(Ferrocarriles Nacionales de México)  
Transit: Instituto Nacional de Estadística, Geografía  
e Informática  
Water: Secretaría de Comunicaciones y Transportes  
(Coordinación General de Puertos y Marina  
Mercante and Dirección General de Puertos)

Banco de México  
Instituto Nacional de Migración  
Instituto Nacional de Estadística, Geografía e  
Informática  
Secretaría de Turismo  
Secretaría de Comunicaciones y Transportes

International Passenger Travel  
Between North America and the  
Rest of the World

Transportation Infrastructure

Transportation Vehicles

Banco de México  
Instituto Nacional de Migración  
Instituto Nacional de Estadística, Geografía e  
Informática  
Secretaría de Turismo  
Secretaría de Comunicaciones y Transportes

Air: Secretaría de Comunicaciones y Transportes  
(Dirección General de Aeronáutica Civil)  
Road: Secretaría de Comunicaciones y Transportes  
(Caminos y Puentes Federales de Ingresos y  
Servicios Conexos and Dirección General de  
Evaluación)  
Pipeline: Petróleos Mexicanos  
Transit: Instituto Nacional de Estadística,  
Geografía e Informática and various local  
transit authorities  
Rail: Secretaría de Comunicaciones y Transportes  
(Ferrocarriles Nacionales de México)  
Water: Secretaría de Comunicaciones y Transportes  
(Coordinación General de Puertos y Marina  
Mercante and Dirección General de Puertos)

Air: Secretaría de Comunicaciones y Transportes  
(Aeropuertos y Servicios Auxiliares and Dirección  
General de Aeronáutica Civil)  
Road: Instituto Nacional de Estadística, Geografía e  
Informática and Secretaría de Comunicaciones y  
Transportes (Instituto Mexicano del Transporte)  
Transit: Instituto Nacional de Estadística, Geografía e  
Informática and various local transit authorities  
Rail: Secretaría de Comunicaciones y Transportes  
(Ferrocarriles Nacionales de México)  
Water: Secretaría de Comunicaciones y Transportes  
(Coordinación General de Puertos y Marina  
Mercante and Dirección General de Puertos)



## **OVERVIEW OF TRANSPORTATION STATISTICS IN THE UNITED STATES**

### **Overview of the U.S. Statistical System**

The U.S. statistical system is highly decentralized. Responsibility for producing federal statistics is divided among approximately 70 agencies. Eleven agencies, located in 9 departments, have statistical activities (collecting, analyzing, producing and disseminating statistical data) as their primary mission. These agencies are the Bureau of Economic Analysis and the U.S. Census Bureau at the Department of Commerce, the Bureau of Labor Statistics at the Department of Labor, the Statistics of Income Division at the Department of Treasury, the Energy Information Administration at the Department of Energy, the National Center of Health Statistics at the Department of Health and Human Services, the Bureau of Justice Statistics at the Department of Justice, the National Center for Education Statistics at the Department of Education, the Economic Research Service and the National Agricultural Statistics Service at the Department of Agriculture and the Bureau of Transportation Statistics at the Department of Transportation. Each of these agencies maintains its own separate budget. In addition, there are approximately 60 other agencies that also conduct statistical activities, although statistics are not the primary mission of these agencies. Oversight and coordination of the U.S. statistical system is the responsibility of the Office of Management and Budget, Office of Information and Regulatory Affairs (OMB/OIRA).

### **Specific Sources of U.S. Transportation and Transportation Related Data and Information**

The following section discusses the roles and

responsibilities of selected U.S. federal agencies along with other organizations that plan, collect, coordinate, develop and maintain transportation and transportation related data and information. For some of these organizations, transportation statistics are a primary focus. For others, it is one of many activities, and for some, it represents a by-product of primary functions. This list represents many of the U.S. sources used in this publication, but should not be viewed as exhaustive. A brief description of each organization's general mission and functions is provided as well as its specific data activities. However, detailed information on agency data activities is not described extensively here. Additional information on specific surveys, methodologies, dissemination and other items can be found at the web sites of individual organizations described below. Some transportation data and information from nonfederal sources also are discussed here.

### ***U.S. Department of Transportation (USDOT)***

Web site: [www.dot.gov/](http://www.dot.gov/)

The mission of the Department of Transportation is to serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets U.S. vital national interests and enhances the quality of life of the public. The Department has five strategic goals: (1) Safety (promote the public health and safety by working toward the elimination of transportation related deaths and injuries), (2) Mobility (shape an accessible, affordable and reliable transportation system for all people and goods), (3) Economic Growth (support a transportation system that sustains U.S. economic growth), (4) Human and Natural Environment (protect and enhance communities and the natural environment affected by transportation) and

(5) National Security (ensure the security of the transportation system for the movement of people and goods). The DOT consists of the Office of the Secretary and twelve individual operating administrations. These include the Bureau of Transportation Statistics, US Coast Guard, the Federal Aviation Administration, the Federal Highway Administration, the Federal Railroad Administration, the Federal Transit Administration, the Maritime Administration, National Highway Traffic Safety Administration, the Research and Special Programs Administration, the Saint Lawrence Seaway Development Corporation, the Surface Transportation Board, the Transportation Administrative Services Center and the Federal Motor Carrier Safety Administration (as of January 2000).

#### Bureau of Transportation Statistics

Web site: [www.bts.gov/](http://www.bts.gov/)

The mission of the Bureau of Transportation Statistics (BTS) is the development of transportation data, information and analysis of high quality and to advance their effective use in both public and private decisionmaking. These decisions focus on transportation investment, policies and planning decisions in the areas of safety, economic activity, mobility, national security and the human and natural environment, which are also the overarching strategic goals of the USDOT. BTS compiles, analyzes and makes accessible information about the nation's transportation systems; collects information on various aspects of transportation; and enhances the quality and effectiveness of the USDOT's statistical programs through research, the development of guidelines and the promotion of improvements in data acquisition and use. BTS customers include the U.S. Congress, federal, state and local governments; transportation-related associations; private

business and industry; universities and the general public. BTS measures its performance in terms of specific data and information outcomes, including relevance, quality, timeliness, comparability, completeness and utility.

BTS' largest data collection programs are the Commodity Flow Survey (CFS) (conducted jointly with the Census Bureau) and the Nationwide Personal Transportation Survey/American Travel Survey (NPTS/ATS, conducted jointly with the Federal Highway Administration), to identify where freight and people go by all modes of transportation. BTS also sponsors the processing of transportation-related data for U.S. merchandise land trade and then analyzes and disseminates this information. In conjunction with the Bureau of Economic Analysis at the Department of Commerce, BTS has developed the Transportation Satellite Accounts (TSAs) for the United States, which provide a way to measure both in-house and for-hire transportation services contribution to gross domestic product (GDP) in a framework consistent with the national accounts. In addition, BTS' Office of Airline Information (OAI) collects, maintains and analyzes financial, market and performance data of the airline industry. BTS also manages the National Transportation Library and leads the Federal Government's effort in developing geo-spatial data for transportation. BTS also is developing the Intermodal Transportation Data Base (ITDB) that will link key safety and other data sets for multimodal analysis through web-based technologies.

#### Federal Aviation Administration

Web site: [www.faa.gov/](http://www.faa.gov/)

The primary function of the Federal Aviation Administration (FAA) is to foster the development and safety of aviation in the



United States. FAA maintains a diverse set of data that supports critical activities in safety regulation; airspace and air traffic management; management of air navigation facilities; research, engineering and development; testing and evaluation of aviation systems; airport programs; and registration of aircraft.

#### Federal Highway Administration

Web site: [www.fhwa.dot.gov/](http://www.fhwa.dot.gov/)

The Federal Highway Administration (FHWA) directly administers a number of road transportation activities, including standards development, research and technology, training, technical assistance, highway access to federally-owned and Indian lands and commercial vehicle safety enforcement. FHWA also has a significant role, working through partnerships, programs, policies and the allocation of resources, in facilitating the strategic development and maintenance of state and local roads and intermodal transportation systems. FHWA statistical activities include the collection, analysis and dissemination of data on the U.S. road system, infrastructure financing, vehicle fuel consumption, vehicle registrations, driver registrations and characteristics of local travel.

#### Federal Motor Carrier Safety Administration

Web site: [www.fmcsa.dot.gov/](http://www.fmcsa.dot.gov/)

The mission of the Federal Motor Carrier Safety Administration (FMCSA) is the issuance, administration and enforcement of federal motor carrier safety regulations and the drug and alcohol testing requirements under U.S. hazardous materials regulations. FMCSA's goal is to achieve continuous safety improvements in the U.S. highway system, intermodal connections and motor carrier operations through the development and promotion of data-driven, analysis-based,

and innovative programs. FMCSA began as a USDOT operating administration in January 2000. FMCSA collects, analyzes and disseminates motor carrier safety and related data.

#### Federal Railroad Administration

Web site: [www.fra.dot.gov/](http://www.fra.dot.gov/)

The mission of the Federal Railroad Administration (FRA) is to promulgate and enforce rail safety regulations, administer railroad financial assistance programs, conduct research and development in support of improved railroad safety and national rail transportation policy and facilitate the development of new and improved rail technology. FRA collects, analyzes and disseminates data on the U.S. railroad system, including traffic, safety and accident reports, as well as information on grade crossings and inspections.

#### Federal Transit Administration

Web site: [www.fta.dot.gov/](http://www.fta.dot.gov/)

The mission of the Federal Transit Administration (FTA) is to assist public and private transit companies in the development of improved transit systems, facilities and equipment, and to provide assistance to state and local governments in financing these systems and facilities. The FTA collects, analyzes and disseminates operating and financial data on transit systems and services in the United States.

#### Maritime Administration

Web site: [www.marad.dot.gov/](http://www.marad.dot.gov/)

The mission of the Maritime Administration (MARAD) is to promote the development, operation and maintenance of the U.S. Merchant Marine. MARAD also seeks to ensure that the United States enjoys adequate shipbuilding and repair service, efficient ports, effective intermodal water and land

transportation systems, and reserve shipping capacity in time of national emergency. MARAD collects, analyzes, maintains and disseminates data on foreign and domestic trade, vessel characteristics and itineraries, port facilities, shipbuilding and repair, ship values, financial reports and operating expenses, shipping activities and maritime employment.

#### National Highway Traffic Safety Administration

Web site: [www.nhtsa.dot.gov/](http://www.nhtsa.dot.gov/)

The mission of the National Highway Traffic Safety Administration (NHTSA) is to improve the safety of motor vehicle transportation by identifying and eliminating motor vehicle and road safety problems. NHTSA collects, analyzes and disseminates data and information on road and vehicle safety, including motor vehicle-related crashes, injuries and fatalities and the economic costs of these.

#### Research and Special Programs Administration

Web site: [www.rspa.dot.gov/](http://www.rspa.dot.gov/)

The mission of the Research and Special Programs Administration (RSPA) is to serve as a long-range research and technical development arm of the USDOT and to conduct special programs. Statistical activities include the collection of data on the movement of hazardous materials and the safety of liquid and natural gas pipelines.

#### Saint Lawrence Seaway Development Corporation

Web site: [www.dot.gov/slslcdc/](http://www.dot.gov/slslcdc/)

The Saint Lawrence Seaway Development Corporation (SLSDC) is responsible for operating and maintaining the St. Lawrence

Seaway in cooperation with Canada, and for developing international trade throughout the Great Lakes Seaway system. Statistical activities include the analysis and dissemination of data specific to the St. Lawrence Seaway.

#### Surface Transportation Board

Web site: [www.stb.dot.gov/](http://www.stb.dot.gov/)

The Surface Transportation Board (STB or Board) is a bipartisan, independent, adjudicatory body, housed within the USDOT. The Board was established following the termination of the Interstate Commerce Commission (ICC) in 1995, and assumed certain ICC regulatory functions. These included broad economic oversight of railroads, and more limited oversight of pipeline carriers, intercity bus carriers, water carriers engaged in noncontiguous domestic trade, household goods carriers, and certain types of motor carriers. The STB collects, maintains and analyzes economic, financial and employment data on Class I railroads in the U.S.

#### U.S. Coast Guard

Web site: [www.uscg.mil/](http://www.uscg.mil/)

The U.S. Coast Guard (USCG) is one of five branches of the U.S. Armed Forces, and falls under the jurisdiction of DOT. The USCG is the country's oldest continuous seagoing service with responsibilities that include search and rescue operations, maritime law enforcement, navigation aids, icebreaking, environmental protection, port security and military readiness. The USCG collects, maintains and analyzes data on recreational boating safety; commercial vessel casualties; merchant marine licensees; USCG inspections of foreign and U.S. vessels, offshore and port facilities; USCG search and rescue performance; and pollution incidents that occur within navigable waters of the United States.



## ***U.S. Department of Commerce (USDOC)***

Web site: [www.doc.gov/](http://www.doc.gov/)

The Department of Commerce promotes job creation, economic growth, sustainable development and improved living standards by working in partnership with business, universities, communities and workers. Specifically, the Commerce Department facilitates technology that is used in the workplace and home every day; supports the development, gathering and transmitting of information essential to competitive business; promotes the diversity of companies and goods; supports environmental and economic health for communities; and conducts the constitutionally mandated decennial census.

### U.S. Census Bureau

Web site: [www.census.gov/](http://www.census.gov/)

The U.S. Census Bureau (Census) is responsible for collecting, tabulating and publishing a variety of statistical data about the United States. Census' responsibilities include the decennial census of population and housing; quinquennial censuses of state and local governments and domestic industries; special censuses done at the request and expense of states and localities, and statistical compilations of U.S. foreign trade. Among its major transportation data activities are the Census of Transportation, the Vehicle Inventory and Use Survey (VIUS), and the Transportation Annual Survey (TAS). The Census of Transportation is conducted every 5 years (years ending in 7 and 2), and collects financial and operational data on domestic establishments that provide passenger and freight transportation. The VIUS (formerly known as the Truck Inventory and Use Survey, or TIUS) measures the physical and operational characteristics of the U.S. private and commercial trucking fleet. The TAS collects data on revenue, expenses and

vehicle fleet inventories for commercial motor freight transportation and public warehousing service industries. In addition, Census jointly conducts the Commodity Flow Survey with the Bureau of Transportation Statistics at DOT.

### Bureau of Economic Analysis

Web site: [www.bea.doc.gov/](http://www.bea.doc.gov/)

The Bureau of Economic Analysis (BEA) is responsible for preparing, developing and interpreting sets of economic accounts that include national income and wealth accounts, state and regional income and product accounts and international trade and balance of payment accounts. In conjunction with the Bureau of Transportation Statistics, BEA helped develop the Transportation Satellite Accounts (TSAs).

### International Trade Administration

Web site: [www.ita.doc.gov/](http://www.ita.doc.gov/)

The International Trade Administration (ITA) disseminates data and reports on U.S. merchandise and service trade, production prices and foreign direct investment in the United States. In addition, the Tourism Industries Office at ITA collects and maintains data on international travel to and from the United States.

## **Other U.S. Federal Agencies**

### ***Bureau of Labor Statistics, U.S. Department of Labor***

Web site: [www.stats.bls.gov/](http://www.stats.bls.gov/)

The Bureau of Labor Statistics (BLS) is responsible for collecting, analyzing and disseminating data on employment, prices and consumer expenditures, compensation and working conditions, productivity and employment projections. This includes data for the U.S. transportation sector.

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***Energy Information Administration, U.S.  
Department of Energy***

Web site: [www.eia.doe.gov/](http://www.eia.doe.gov/)

The Energy Information Administration (EIA) is responsible for collecting, processing and publishing energy supply and demand data and information on energy consumption, distribution and related technologies. EIA develops analyses on energy trends and their micro- and macroeconomic effects. Coverage includes data on coal, petroleum, natural gas, and electric and nuclear energy.

***Environmental Protection Agency***

Web site: [www.epa.gov/](http://www.epa.gov/)

The Environmental Protection Agency (EPA) monitors the quality of the air and drinking, surface and ground water, ecosystem status and the introduction of toxic or hazardous substances into the environment. It conducts research and studies to provide baseline data and to evaluate and support environmental monitoring systems. Established in 1997, the Center for Environmental Information and Statistics (CEIS) is EPA's one-stop source of data and information on environmental quality and trends.

***National Transportation Safety Board***

Web site: [www.nts.gov/](http://www.nts.gov/)

The National Transportation Safety Board (NTSB) is an independent federal agency charged by the U.S. Congress with investigating every civil aviation accident in the United States and significant accidents in the railroad, highway, marine and pipeline modes. It also issues safety recommendations aimed at preventing future accidents. The NTSB compiles, analyzes and disseminates data and information on transportation accidents that it investigates.

***U.S. Army Corp of Engineers, U.S.  
Department of Defense***

Web site: [www.usace.army.mil/](http://www.usace.army.mil/)

The U.S. Army Corps of Engineers (USACE) is responsible for the operation and maintenance of the U.S. waterway system to ensure efficient and safe passage of commercial and recreational vessels. The USACE's Navigation Data Center (NDC) is responsible for establishing and maintaining a variety of navigation-oriented databases. These include databases of foreign and domestic waterborne commerce, domestic commercial vessels, port facilities, lock facilities and operations and navigation dredging projects.

***U.S. Customs Service, U.S. Department  
of Treasury***

Web site: [www.customs.ustreas.gov/](http://www.customs.ustreas.gov/)

The U. S. Customs Service (Customs) ensures that all imports and exports comply with U.S. laws and regulations. Customs collects and verifies tariff and trade data, which the Census Bureau tabulates, analyzes and disseminates. In addition, Customs collects and maintains border crossing data for passengers, vehicles and vessels entering the United States.

***Nongovernment Organizations and  
Associations***

This list represents selected nongovernmental organizations and associations that were used as U.S. resources for this publication. This list should *not* be viewed as an exhaustive list of nongovernmental organizations and associations that maintain and analyze transportation and transportation related data for the United States. A brief description of each organization's general mission and functions is provided as well as its specific data activities.

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### ***Association of American Railroads***

Web site: [www.aar.org/](http://www.aar.org/)

The Association of American Railroads (AAR) represents North America's major freight railroads and Amtrak. Among its activities, AAR compiles and disseminates a variety of data on railroads, including its annual *Railroad Fact* book, which provides financial and operating statistics for Class I railroads in the United States.

### ***American Public Transit Association***

Web site: [www.apta.com/](http://www.apta.com/)

The American Public Transit Association (APTA) represents operators of bus, rapid transit and commuter rail systems, and the organization is responsible for planning, designing, constructing, financing and operating transit systems. Among its activities, APTA compiles and publishes transit data, including its annual *Transit Fact Book*.

### ***Association of Oil Pipe Lines***

Telephone: 202-408-7970

The Association of Oil Pipe Lines is an unincorporated nonprofit organization, which among other activities, assembles, maintains and disseminates current information about the U.S. oil pipeline industry.

### ***American Gas Association***

Web site: [www.aga.com/](http://www.aga.com/)

The American Gas Association (AGA) represents 181 local natural gas utilities that deliver gas to 54 million homes and businesses in all 50 states. Among its activities, AGA acts as a clearinghouse for natural gas energy information.



<b>Transportation statistical subject</b>	<b>U.S. sources for data and analysis</b>
Country Overview Data	Population and Area: U.S. Census Bureau Labor Force: Bureau of Labor Statistics Gross Domestic Product: Bureau of Economic Analysis
Transportation and the Economy	Bureau of Transportation Statistics U.S. Census Bureau Bureau of Economic Analysis Bureau of Labor Statistics
Transportation Safety	Air: Federal Aviation Administration Water: Maritime Administration and U.S. Coast Guard Road Motor Vehicles: National Highway Traffic Safety Administration and Federal Highway Administration Pipeline: Research and Special Projects Administration Transit: Federal Transit Administration Rail: Federal Railroad Administration Multimodal Analysis: Bureau of Transportation Statistics Multimodal Investigations: National Transportation Safety Board
Transportation, Energy and the Environment	Energy: Bureau of Transportation Statistics Energy: Other U.S. DOT Modal Administrations Energy: Energy Information Agency Environment: Environmental Protection Agency Environment: Bureau of Transportation Statistics
Domestic Freight Activity	Air: Bureau of Transportation Statistics Water: Army Corps of Engineers Road: Bureau of Transportation Statistics and U.S. Census Bureau Rail: Federal Railroad Administration Multimodal: Bureau of Transportation Statistics and U.S. Census Bureau
North American Merchandise Trade	Air: Bureau of Transportation Statistics and U.S. Census Bureau Road: Bureau of Transportation Statistics Rail: Bureau of Transportation Statistics Pipeline: Bureau of Transportation Statistics



North American Merchandise Trade— <i>Continued</i>	<p>Water: Army Corps of Engineers and Maritime Administration</p> <p>Land Border Crossing: Customs Service</p>
International Merchandise Trade Between North America and the Rest of the World	<p>Air: Bureau of Transportation Statistics and U.S. Census Bureau</p> <p>Road: Bureau of Transportation Statistics</p> <p>Rail: Bureau of Transportation Statistics</p> <p>Pipeline: Bureau of Transportation Statistics</p> <p>Water: Army Corps of Engineers and Maritime Administration</p>
Domestic Passenger Travel	<p>Air: Bureau of Transportation Statistics</p> <p>Road: Federal Highway Administration</p> <p>Transit: Federal Transit Administration and American Public Transit Association</p> <p>Rail: Federal Railroad Administration, Amtrak, and American Public Transit Association</p> <p>Long Distance Travel: Bureau of Transportation Statistics</p>
North American Passenger Travel	<p>Air: Bureau of Transportation Statistics</p> <p>Long Distance Travel: Bureau of Transportation Statistics</p> <p>Land Border Crossing: Customs Service</p>
International Passenger Travel Between North America and the Rest of the World	<p>Air: Bureau of Transportation Statistics and International Trade Administration</p> <p>Long Distance Travel: Bureau of Transportation Statistics</p>
Transportation Infrastructure	<p>Water: Army Corps of Engineers</p> <p>Road: Federal Highway Administration</p> <p>Transit: Federal Transit Administration and American Public Transit Association</p> <p>Rail: Federal Railroad Administration, Amtrak, and American Public Transit Association</p>
Transportation Vehicles	<p>Air: Federal Aviation Administration and Bureau of Transportation Statistics</p> <p>Water: Maritime Administration, U.S. Coast Guard and Army Corps of Engineers</p> <p>Road: Federal Highway Administration</p> <p>Transit: Federal Transit Administration and American Public Transit Association</p> <p>Rail: Federal Railroad Administration, Amtrak, and American Public Transit Association</p>



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a p p e n d i x

B

# Additional Sources and Technical Notes





# appendix B

## Additional Sources and Technical Notes

### SECTION 1: COUNTRY OVERVIEW

**Table 1-1**  
**National Population and Labor Force**

#### Canada

National population and labor force: Statistics Canada *Annual Demographics Statistics, Catalogue no. 91-213-XPB*. (Ottawa, Ont.: various years).

Statistics Canada Special tabulations. (Ottawa, Ont.: 1998).

Urban population: Statistics Canada 1996 Census of Population. *A national overview-population and dwelling counts, Catalogue no. 93-357-XPB*. (Ottawa, Ont.: 1997).

*National population:* National population data in this table are based on postcensal population estimates. The estimates are based on data for each province and territory where the base population used to derive postcensal population estimates is the 1991 census count of population by age, sex and marital status adjusted to July 1, 1991, and for net census undercoverage. The postcensal estimates by age, sex and marital status are obtained by the component method. The demographic events that occurred between July 1, 1991, and the reference date of the estimate are added to or subtracted from the July 1, 1991, population. Demographic events can be divided into two groups according to the type of data used: those that data are readily available (births, deaths, marriages, divorces and immigration)

and events that have to be estimated (inter-provincial migration, return of Canadians, emigration, net changes in nonpermanent residents and new widowhood).

*Urban percentages:* Canadian urban and rural population percentages are based on 1996 census counts. Urban and rural data are based on the following definitions. Canadian urban areas have minimum population concentrations of 1,000 and a population density of at least 400 persons per square kilometer, based on the previous census population counts. All territory outside of urban areas is considered rural. Taken together, urban and rural areas cover all of Canada.

*Labor force:* Total labor force refers to the number of Canadians over the age of 15 who are in the labor force, whether they are employed or unemployed. Note that not everyone in the 15-and-over age group is in the labor force. See notes under Tables 2-4 and 2-5 for more detail.

#### Mexico

National and urban population: Instituto Nacional de Estadística, Geografía e Informática. *XI Censo General de Población y Vivienda, 1990. Estados Unidos Mexicanos. Perfil Sociodemográfico*. (Aguascalientes, Ags.: 1992).

Instituto Nacional de Estadística, Geografía e Informática. *Conteo de Población y Vivienda, 1995. Estados Unidos Mexicanos. Resultados Definitivos. Tabulados Básicos*. (Aguascalientes, Ags.: 1996).

Instituto Nacional de Estadística, Geografía e Informática. *Conteo de Población y Vivienda, 1995. Estados Unidos Mexicanos. Perfil Sociodemográfico*. (Aguascalientes, Aguascalientes, Ags.: 1997).

Instituto Nacional de Estadística, Geografía e Informática. *Encuesta Nacional de la Dinámica Demográfica, 1997*. (Aguascalientes, Aguascalientes, Ags.: 1997).

**Labor force:** Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. *Encuesta Nacional de Empleo, 1991, 1995 and 1996*. (Aguascalientes, Aguascalientes, Ags.: various years).

**National population:** The national population is comprised of Mexican citizens, noncitizen residents who were living in Mexico at the time the census was taken and Mexicans in the diplomatic service. For 1997, data were taken from the *Encuesta Nacional de la Dinámica Demográfica* (National Survey on Demographic Dynamics). For 1990, 1995 and 1997, there were 0.5, 0.2 and 0.03 million residents who did not give their age. These are included in the category "over 65 years of age."

**Urban percentages:** The urban population is based on areas with more than 2,500 inhabitants.

**Population density:** Population density was estimated from the country's surface area of 1,967,183 square kilometers, using as the source the *XI Censo de Población y Vivienda, 1990* (XI Population and Household Census, 1990).

**Labor force:** Labor force data were estimated from the *Encuesta Nacional de Empleo* (National Employment Survey) for the second quarters of 1991, 1995 and 1996. The estimate was based on the economically active

population, defined as anyone of age 12 or older (*Población Económicamente Activa*, or PEA). The percentage of labor force was calculated using the total population in 1991, 1995 and 1996. The survey, *Encuesta Nacional de Empleo*, is a joint effort of the Instituto Nacional de Estadística, Geografía e Informática and the Secretaría del Trabajo y Previsión Social (Ministry of Labor and Social Welfare) with coverage throughout Mexico.

Labor force data in Table 1-1 differ from labor force data in Table 2-4 because the two tables use different sources. The data in Table 2-4 are derived from estimates of the National Account System of Mexico, and are the number of positions considered as necessary for production. See notes under Table 2-4 for a more complete explanation.

### United States

**National population and age structure:** U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States 1998*. (Washington, DC: 1998). Table Nos. 12 and 14.

**Urban population:** U.S. Department of Commerce. U.S. Census Bureau. *Estimates of the Population of Metropolitan Areas: Annual Time Series, July 1, 1991, to July 1, 1996*. (Washington, DC: 1997).

**Population density:** U.S. Department of Commerce. U.S. Census Bureau. *State Population Estimates: Annual Time Series, July 1, 1990, to July 1, 1998*. (Washington, DC: 1998).

**Labor force:** U.S. Department of Commerce. U.S. Census Bureau and the Bureau of Labor Statistics. *Current Population Survey*. (Washington, DC: 1998).

**National population:** National population figures for the U.S. represent the resident popu-

lation based on the 1990 Census of Population and Housing. Resident population includes all people who usually live within the United States. This excludes the U.S. Armed Forces overseas and civilian U.S. citizens whose usual place of residence is outside the United States. Data include Puerto Rico and U.S. Territories. The following formula was applied to update each group for 1995 and 1996: the 1990 enumeration of resident population, plus births to U.S. resident women, minus deaths to U.S. residents, plus net international migration, and plus net movement of U.S. Armed Forces and civilian citizens to the United States.

*Urban percentages:* Urban percentages are based on U.S. definitions of these areas. In general, an urbanized area comprises one or more places ("central place") and the adjacent densely settled surrounding territory ("urban fringe") that together have a minimum of 50,000 persons. Data include Puerto Rico and U.S. territories. The data for 1990 are revised 1990 decennial census figures. The data for 1995 and 1996 are population estimates for those years. These aforementioned estimates incorporate revisions of estimates from previous years and the results of special and test censuses conducted by the U.S. Census Bureau.

*Labor force:* Labor force data represent the U.S. civilian labor force. The civilian labor force includes all U.S. citizens aged 16 and older who have jobs and also includes those without jobs but who are available for work and looking for work. This figure excludes those who work for the U.S. military. The civilian labor force data include Puerto Rico and U.S. Territories.

## Tables 1-1a, 1-1b and 1-1c Top Population Centers

### Canada

Statistics Canada. *Annual Demographics Statistics, Catalogue no. 91-213-XPB*. (Ottawa, Ont.: 1998).

*Metropolitan areas:* The Canadian Census Metropolitan Area (CMA) is a very large urban area (known as an "urban core") plus adjacent urban and rural areas (known as "urban and rural fringes") that have a high degree of social and economic integration with the urban core. A CMA has an urban core population of at least 100,000, based on the previous census. Once an area becomes a CMA, it is retained as a CMA even if the population of its urban core declines below 100,000. All CMAs are subdivided into census tracts. A CMA may be consolidated with adjacent census agglomerations (CAs) if they are socially and economically integrated.

### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Estadísticas del Medio Ambiente, 1997*. (Aguascalientes, Agu.: 1998).

*Metropolitan areas:* The table lists the number of people living in the most densely populated areas; these include metropolitan areas, metropolitan zones and cities. By definition a metropolitan area (MA) is formed when two or more urban sites or cities (located in different municipalities or states) grow to the point where they have physically merged, to form a continuous population concentration of 100,000 inhabitants or more. A metropolitan zone (MZ) includes the MA, plus the municipalities to which the components of the MA belong. The other geo-



graphical locations in Table 1-1b are cities with populations of 15,000 or more. They do not meet the definition of Metropolitan Zones or Areas.

### United States

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States 1998*. (Washington, DC: 1998).

*Metropolitan areas:* The United States defines Metropolitan Statistical Areas (MSAs) as a core area with a large population (usually 50,000 or more) together with adjacent communities having a high degree of social and economic integration. If an MSA has a population of more than 1 million, with separate component areas, it is designated a Consolidated Metropolitan Statistical Area (CMSA) with the components designated as Primary Metropolitan Statistical Areas (PMSA). For instance the Los Angeles-Riverside-Orange County, CA CMSA is made up of the Los-Angeles-Long Beach PMSA, the Orange County PMSA, the Riverside-San Bernardino PMSA and the Ventura PMSA.

**Table 1-2**  
**Area**

### Canada

Natural Resources Canada. GeoAccess Division. (Ottawa, Ont.: 1998).

*Land and water area:* The official source of Canada's land and water area is the GeoAccess Division of Canada Centre for Remote Sensing in Natural Resources Canada (NRCan). Area data were calculated in 1981 using planimeters on large-scale maps (scale of 1: 250 000). GeoAccess produces the *National Atlas of Canada*, which contains various types of maps showing the extent of Canada's land and water area. Water data in-

clude inland waters, Great Lakes waters and coastal waters, but do not include offshore waters such as fishing zones, internal salt waters and territorial seas. (Canada has legal jurisdiction over a very large area of offshore waters. The Canadian Hydrographic Service of Fisheries and Oceans Canada has determined the total extent of these waters to be 5.9 million square kilometers.) Canada is the second largest country in the world, with a total area (land plus freshwater) of 10 million square kilometers. Located primarily above the 49th parallel of latitude, Canada borders on three oceans, the Atlantic to the east, Arctic to the north and Pacific to the west.

### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Geografía. (Aguascalientes, Ags.: 1998).

*Land and water area:* Data come from semi-automatic digital measurements, which provide accurate values for land area. Water area represents inland waters (such as ponds, bays, inlets, lagoons, marshes, etc.), coastal waters (provided their geography conforms to the International Agreement on Maritime Territory (inlet less than 24 nautical miles; i.e., less than 44.448 km)) and territorial seas (waters within 12 nautical miles of the Mexican shoreline). Data for water area also include islands (5,127 square km) and maritime territory (209,000 square km).

### United States

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States 1998*. (Washington, DC: 1998). Table No. 387.

*Land and water area:* U.S. land and water areas are defined by the TIGER (Topologically Integrated Geographic Encoding and Refer-



encing) database maintained at the Census Bureau. The water data represent the total of four major water classifications: inland water (all lakes ponds, rivers, streams, creeks or similar bodies of water with the exception of the Great Lakes); coastal water (major bays and nonenclosed areas); territorial seas (water located within 3-nautical miles of the U.S. shoreline); and Great Lakes water (includes the five Great Lakes, Lake St. Clair and the St. Lawrence Seaway). Area data for U.S. territories can be found in Table 387 of the 1998 *Statistical Abstract of the United States*.

**Table 1-3**  
**Gross Domestic Product by Industry**  
(Current U.S. dollars)

**All Countries**

*Gross domestic product:* Gross domestic product (GDP) is an aggregate measure of output of goods and services produced by factors, including land, labor and capital, located in a particular country. As the most widely-used aggregate indicator of the size of a country's economy, GDP measures the total value of goods and services produced in a given period minus the total cost of goods and services used as intermediate inputs. For an industry, the difference between the total output and the total intermediate input is the industry's total value added. Therefore, GDP is the sum of all industries' value added or GDP by industry. GDP by industry shows how much of the total GDP was created in each industry.

There are several different valuation approaches to measuring the GDP by industry. For example, factor cost valuation represents the earnings of the factors of production and is measured by the costs of labor (wages and

salaries, supplementary labor income) and capital inputs (mixed income and other operating surplus) in the production process. The market price approach brings the valuation of production up to the "market price" level. In order to derive the measure of GDP at market prices for the total economy, net indirect taxes (i.e., indirect taxes less subsidies) should also be added to the measure of GDP at factor cost as they are part of the market price of goods and services. The indirect taxes include taxes on production such as payroll and property taxes and taxes on products such as sales tax. In Table 1-3, the United States and Mexico estimates are based on market price evaluation. The Canadian estimates are based on an evaluation, which includes net indirect taxes paid on production and sales taxes paid by industries. The difference is that sales taxes collected by industries but paid by end users are not included in the Canadian estimates.

The industry categories included in Table 1-3 are broad aggregates for economic activity by industry. The industry categories included in Table 1-3 are a modified version of the 1987, U.S. Standard Industry Classification (S.I.C.). At this level, these categories are generally comparable across the three countries. However, there are instances where modifications and recategorization of individual country data have occurred. These are explained in the individual country notes.

In general, however, the following definitions, of these industries are as follows: *Agriculture, forestry and fishing* includes agricultural and related service industries, fishing and trapping industries and logging and forestry industries. *Mining* includes mining, quarrying and oil well industries. *Construction* includes construction industries. *Manufacturing* includes manufacturing industries. *Com-*

*munications* include communication and related service industries. *Utilities* include electricity, natural gas, water, sanitation and other utility services. *Wholesale trade* includes wholesale trade industries. *Retail trade* includes retail trade industries. *Finance, insurance and real estate* includes finance, insurance and real estate industries. *Services* includes business service industries, education service industries, health and social service industries, accommodation, food and beverage industries, other service industries and nonprofit institutions serving households.

The industry subcategories under *Transportation* are based on the following definitions. *Railroad* transportation includes rail transportation and related service industries. *Local and Interurban Passenger* includes mass transit transportation (both transit rail and bus), interurban and rural transit, taxicab, school and other bus operations, and other related industries. *Trucking, Warehousing and Storage* include truck transportation industries and other storage and warehousing industries. *Water* includes water transportation and related service industries. *Air* includes air transportation and related service industries. *Pipelines, excluding natural gas* includes crude oil and other pipeline transport industries. *Transportation services* includes other incidental service industries such as services of travel agencies, tour operators, freight forwarders and brokers, rental services and other miscellaneous transportation services.

### Canada

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1999).

In order to derive the measure of Canada's GDP by industry cost for the total Canadian

economy, net indirect taxes (i.e., indirect taxes less subsidies) paid by industries were added to the measure of GDP at factor cost. The "net indirect taxes," in this case, indicate that subsidies have been subtracted from the indirect tax total.

The industry categories included in Table 1-3 are broad aggregates for economic activity by industry. The industry categories included in Table 1-3 are a modified version of the 1987, U.S. Standard Industry Classification (S.I.C.). Canadian data included in Table 1-3 are, for the most part, based on Canada's 1980 Standard Industrial Classification (SIC-80) with the one exception being the category of government, which includes all nonprofit government-funded activity (regardless of industrial activity). Agriculture, forestry and fishing include: agricultural and related services industries, fishing and trapping industries and logging and forestry industries. Transportation industries include related services for railroad, water, air and transportation services. Trucking, warehousing and storage includes other warehousing and storage industries. Utilities include natural gas pipeline transport. Services include: business service industries, accommodations, food and beverage industries, other service industries and private and nonprofit institutions servicing households.

### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Agu.: 1997).

The base year for the *Sistema de Cuentas Nacionales de México* (Mexico's National Account System) is 1993, based on the United Nation's framework for national accounts. This



framework resulted from a joint effort of the European States Commission (EUROSTAT), the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD) and the World Bank. The classification scheme used in Table 1-3 does not match exactly with that of the *Sistema de Cuentas Nacionales de México*, since some adjustments were made for comparability purpose across the three countries. The following adjustments were made:

Transportation in this table is based on the industry category of "Transportation, Warehousing and Communications" in the *Sistema de Cuentas Nacionales de México*. (Specifically, "transportation, warehousing and communications" is considered Gran Division 7, or GD 7 in the *Sistema de Cuentas Nacionales de México*.) However, for Table 1-3, the Transportation and Warehousing categories have been separated from Communications. Under the category "Transportation Services" in Table 1-3, the following were included: customs agencies, travel agencies, parking lots, hauling and weighing services and other transportation related services such as management of ports, airports and bus stations, coordination of roads and toll booths, control of radar and flight stations and the unloading and stowing of goods. The data for the category "Utilities" in Table 1-3 are based on Mexico's Gran Division 5 (GD 5) in its *Sistema de Cuentas Nacionales de México*, and include the following industries: electricity, natural gas and water. The data for the category "Services" in Table 1-3 are based on Mexico's Gran Division 6 (GD 6) in its *Sistema de Cuentas Nacionales de México*, and include the following industries: professional services such as schooling, health care, recreational and others. Restaurants and hotels

also were included in the data for the "Services" category in Table 1-3. In Mexico's *Sistema de Cuentas Nacionales de México*, restaurants and hotels would usually be counted in the category of "Commerce."

### United States

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. (Washington, DC: August 1996 and November 1999).

U.S. GDP data by industry in Table 1-3 are measured at market price, which includes factor cost and net indirect taxes. The industry classification and definition used in this table for the United States are generally based on the U.S. 1987 Standard Industrial Classification (SIC). However, some regroupings have been done for the sake of comparison. One regrouping has been done for transportation, communications and utilities, which are classified in Division E in the 1987 SIC. *Utilities* include electric, natural gas, sanitation and other miscellaneous utility services. The *Commerce* subcategory represents a combining of the U.S. SIC Division F for wholesale trade and Division G for retail trade. Starting in 1996, the Bureau of Labor Statistics reclassified some of the multimodal courier services from trucking to the air transportation industry. It was not possible to reclassify data for previous years. Therefore, the decrease in the trucking, warehousing and storage industry between 1995 and 1996 is reflective of a change in the data time series rather than an actual decrease in this industry. More detailed explanations can be found in the *Standard Industrial Classification Manual 1987* (U.S. Office of Management and Budget, Washington, DC).

## SECTION 2: TRANSPORTATION AND THE ECONOMY

### Tables 2-1

#### Gross Domestic Product (GDP) Attributed to Transportation-Related Final Demand

(Current U.S. dollars)

##### All Countries

Transportation-related final demand is the sum of all consumer and government expenditures for transportation purposes, plus the value of goods and services purchased by businesses as investment for transportation purposes. It measures the importance of transportation from a demand perspective. Since it includes only expenditures on the final products of an economy, transportation-related final demand is comparable to Gross Domestic Product.

##### Canada

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 1-3. Canadian data are based on Canada's 1980 Standard Industrial Classification (SIC-80). However, a number of Canadian industry classifications were regrouped for the purposes of this table. The category "gross private domestic investment" in Table 2-1 excludes investment in telecommunication structures.

##### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Ags: 1997).

See notes for Table 1-3. Mexican data are based on Mexico's 1993 *Sistema de Cuentas*

*Nacionales de México* (Mexico's National Account System), for which the base year is 1993. However, a number of Mexican industry classifications were regrouped for the purposes of this table.

##### United States

Data used in this Table 2-1 are compiled by the Bureau of Transportation Statistics (BTS) based on the U.S. National Income and Product Accounts. This table is based on the following primary sources:

1990: U.S. Department of Commerce. Bureau of Economic Analysis. *Historical Data Tables*. (Washington, DC: 1990).

1995, 1996: U.S. Department of Commerce. Bureau of Economic Analysis (BEA). *Survey of Current Business*, August 1998, (Tables 2.6, 3.10, 4.3, 5.6, 5.8 and p.148); October 1998, (Tables 3.16 and 3.17), and special tabulations based on BEA's underlying statistical details. (Washington, DC: 1998).

*Personal consumption of transportation, total*: Road motor vehicles consist of new autos, used autos and other road motor vehicles such as new trucks and used trucks. Motor vehicles used primarily for recreation, boats, noncommercial trailers and aircraft are excluded. Road motor vehicle parts include tires, tubes, accessories and other parts. Motorcycles and other include motorcycles and bicycles. Transportation services include repair, greasing, washing, parking, storage, rental, leasing, tolls, insurance, purchased local and intercity transportation services. Motor fuel and lubricants include gasoline (all types) and oil used for autos, trucks, airplanes, motorcycles and boats. Details on airplane and boat shares are not available. A more detailed description of these items is provided in the technical notes for Table 2-2.



*Gross private domestic investment, total:* Transportation structures include railroads and petroleum pipelines. Transportation equipment consists of trucks, buses, truck trailers, autos, aircraft, ships and boats and railroad equipment.

*Exports/imports, total:* Goods and services that are counted as part of exports/imports include civilian aircraft, engines and parts; road motor vehicles, engines and parts; passenger fares, (including the receipts/payments of U.S./foreign air and ocean/cruise carriers for the transportation of non-U.S. residents/U.S. residents between the United States and foreign countries or between two foreign points) and other transportation. The total for road motor vehicle, engines and parts excludes boats, aircraft and noncommercial trailers. Other transportation includes the freight revenues of U.S./foreign-operated ocean, air and other carriers (such as rail, pipeline and Great Lakes shipping) for international transport of U.S. exports/imports and for the transportation of foreign freight between foreign points; port expenditure receipts (representing payments for goods and services purchased in the United States/foreign countries by foreign-operated/U.S. carriers); and receipts/payments of U.S./foreign owners from foreign operators for the charter of vessels and rental of freight cars and containers.

*Government transportation-related purchases, total:* Government purchases represent the sum of consumption expenditures and gross investment. Government purchases include federal, state and local purchases of transportation services of roads, water, air, railroad and transit. Government expenditures on transportation-related structures and equipment also are included. Defense related purchases include expenditures on

transportation of materials (care and movement of goods by water, rail, truck and air), the rental of trucks and other transportation equipment and warehousing fees, and travel of persons (care and movement of Department of Defense military and civilian employees), including tickets for all modes of travel, per diem, taxi fares, automobile rental and mileage allowances for privately owned vehicles.

**Table 2-2**  
**Personal Consumption Expenditures**  
**on Transportation by Subcategory of**  
**Expenditure**

(Current U.S. dollars)

**All Countries**

Personal consumption expenditures for transportation in Table 2-2 are conceptually the same as those that are included in Table 2-1. This table presents the same information with more detail, organized into different categories. Note that expenditures for freight shipments are not included in the U.S. and Mexican consumption data. However, expenditures for freight shipments by rail and intercity bus are included in Canadian data.

**Canada**

Statistics Canada. Input-Output Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 1-3. Canadian data are based on Canada's 1980 Standard Industrial Classification (SIC-80). However, a number of Canadian industry classifications were regrouped for the purposes of this table. Data in Table 2-2 reflect personal consumption expenditures by Canadian residents both in Canada and in foreign countries. Personal expenditures in Canada by foreigners are excluded.

## Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Aguascalientes: 1997).

See notes for Table 1-3. Mexican data are based on Mexico's 1993 *Sistema de Cuentas Nacionales de México* (Mexico's National Account System), for which the base year is 1993. However, a number of Mexican industry classifications were regrouped for the purposes of this table.

## United States

Data used in Table 2-2 are compiled by the Bureau of Transportation Statistics (BTS) based on the U.S. National Income and Product Accounts. This table is based on the following primary sources:

1990: U.S. Department of Commerce. Bureau of Economic Analysis (BEA). *Historical Data Tables*. (Washington, DC: 1990).

1995, 1996: U.S. Department of Commerce. Bureau of Economic Analysis (BEA). *Survey of Current Business*, August 1998, Tables 2.4 and special tabulations based on BEA's underlying statistical details. (Washington, DC: 1998).

*User-operated transportation, total*: Combined as a whole, the categories for new and used passenger cars; new and used trucks; and parts and accessories of road motor vehicles correspond to the entry for road motor vehicles and parts in Table 2-1. As in Table 2-1, motor vehicles used primarily for recreation such as recreational boats, noncommercial trailers and aircraft are excluded from Table 2-2.

Data for new cars and trucks represent the number of units sold multiplied by the average retail list price, adjusted for discounts, sales taxes and transportation costs. Data for used cars and trucks represent the sum of profit margins that dealers make from selling used cars and trucks to nonbusiness buyers, plus adjustments for changes in the stock of used cars and trucks. Reimbursements to employees who purchase used cars for business or mixed-purpose uses, also are added. Reimbursements to employees who purchase used trucks for business or mixed-purpose uses are not included.

New and used motorcycles and other motor vehicles include motorcycles and bicycles. Parts and accessories of road motor vehicles consist of tires, tubes, accessories and other parts. Repair and rental include: (1) automotive repair shops, passenger car rental and leasing establishments, and other automotive service establishments; (2) gasoline service stations and other retail establishments handling motor vehicle repair and rental and leasing and (3) repair services by franchised car and truck dealers. Motor fuel (gasoline and diesel) and lubricants also include coolant and other products. Tolls consist of bridge, tunnel, ferry and road tolls. Insurance consists of premiums, less benefits and dividends, for motor vehicle insurance.

*Purchased intercity/local and suburban transportation*: The other category for purchased intercity transportation consists of baggage charges, coastal and inland waterway fares, travel agents' fees and airport bus fares. The mass transit category of local and suburban transportation consists of both transit rail and bus services.



**Table 2-3**  
**Government Expenditures for**  
**Transportation by Mode**

(Current U.S. dollars)

### Canada

Statistics Canada. Public Institutions Division. Special tabulations. (Ottawa, Ont.: 1999).

*Data coverage:* Data for government expenditures in this table reflect outlays for all phases of the acquisition, construction, operation and maintenance of the relevant transportation facilities and equipment as well as expenditures pertaining to related engineering and technical surveys. This function now includes the government transfers to its own business enterprises engaged in the transportation activities, especially public transit and railway services.

*Air:* Data reflect expenditures for navigational, air traffic and other related services, operating subsidy payments to regional air carriers and municipal airports, grants to flying clubs and payments for international air navigational services. At the provincial level, data include assistance to the aviation industry, municipal airports and other related services. At the local level, data include outlays related to municipal airports.

*Water transport:* Data reflect expenditures on development, maintenance, operation and control of navigational channels, canals, harbor and wharf facilities, ferries that do not form integral part of road systems, landings and other marine facilities. It also includes the costs of the related operations of the Coast Guard and certain northern transportation services.

*Pipeline, oil and gas:* Data reflect expenditures on the operation, construction, use and

maintenance of pipeline as well as grants and contributions to support the operation, construction and maintenance of pipeline systems.

*Rail:* Data reflect expenditures on the development, implementation and monitoring of policies and programs related to railway network rationalization and effectiveness. Rail data also include payments for railway relocation, contributions to railway passenger services infrastructure and to freight movements in certain geographical regions as well as grants for operations of railway facilities to resource areas.

*Road:* Data reflect expenditures on highways, secondary roads, roads to resource areas, boulevards, avenues and streets together with related storm sewers (where separated from sanitary sewers). Bridges, over and underpasses and road tunnels incorporated in highways also are included as well as those ferries that are usually operated by highway departments and form integral parts of road systems. Such ferries are distinguished from major lake and seagoing vessels and their supporting operations, which (if not classified as business enterprises), are assigned to the "water transport" category. The road data also include the costs of removing snow, debris, leaves and other deposits as well as surface sanding and flushing, expenses pertaining to traffic control and parking facilities.

### Mexico

1990: Secretaría de Programación y Presupuesto. *Cuenta de la Hacienda Pública Federal, 1990.* (Mexico City, D.F.: 1991).

1995 and 1996: Secretaría de Hacienda y Crédito Público. *Cuenta de la Hacienda Pública Federal, 1995 y 1996.* (Mexico City, D.F.: 1996 and 1997).

*Rail:* Prior to 1996, freight and passenger railroad transportation services were provided by a single decentralized public agency. Expenditures for passenger services are included in freight services, but the amount is not significant. The decrease in expenditures was due to a reduction in public investment and to a significant and gradual reduction since 1991 of operational personnel by the Ferrocarriles Nacionales de México. This reduction was part of the preparation by the Ferrocarriles Nacionales de México for the transfer of rail service to the private sector. The first part of the transfer took place in December 1996. In addition, the intensive economic contraction of Mexico in 1995 caused a drop in public expenditures.

### United States

U.S. Department of Transportation. Bureau of Transportation Statistics. Special Tabulations. (Washington, DC: 1999) Based on the following primary sources:

1990: U.S. Department of Commerce. U.S. Census Bureau. *Government Finances: 1989-90*. (Washington, DC: 1990).

1995 and 1996: U.S. Department of Commerce. U.S. Census Bureau. Web site: [www.census.gov/govs](http://www.census.gov/govs)

All years, rail and pipeline: U.S. Department of Transportation, Bureau of Transportation Statistics. *Government Transportation Financial Statistics*. (Washington, DC: 1997).

Data for government expenditures in Table 2-3 refer to local, state and Federal Government in the United States. There are different sources of government expenditure data. For example, government accounts in the U.S. national account system, provide data on government consumption and gross investment. The publication, *Government Trans-*

*portation Financial Statistics* of the U.S. Bureau of Transportation Statistics, has extensive data on government expenditures on transportation. Table 2-3 uses the same sources as the *Government Transportation Financial Statistics* report, but the data are organized differently and include more original details from the primary data source, the *Annual Survey of Government Finances*, conducted by the U.S. Census Bureau.

The *Annual Survey of Government Finances* covers the entire range of government finance activities, including revenues, expenditures, debt and assets. This table is based on government expenditure data. Government expenditures are all direct expenditures, or direct expenditures by federal, state or local governments. (Intergovernmental transfers such as federal to state grants where funding is directly expended at the state level are only counted once.). Infrastructure expenditures include those for production of fixed works and structures and additions, replacements and major alterations. Equipment expenditures include those for purchase of equipment and for payments on capital leases. In some cases, purchase of land and existing structures also are included because data do not allow their separation. Expenditures on current operations include those for compensation of officers and employees and for supplies, materials, operating leases and contractual services. Data for pipelines and railroads are from *Government Transportation Financial Statistics* of the U.S. Bureau of Transportation Statistics, since the census does not provide any data on these modes.

For 1995, 1995 data for state and local governments and 1992 data for the Federal Government are included. For 1996, 1996 data for state governments, 1995 data for local



governments and 1992 data for the Federal Government are included. More recent federal data were not available during the research phase of this project. All data are on fiscal year basis (for example, fiscal year 1996 represents October 1, 1995, through September 30, 1996).

**Table 2-4**  
**Employment in Transportation and Related Industries**

### **All Countries**

Employment by industry groups provides employment information according to the primary nature of a business. Table 2-4 shows how many people (based on the number of employees) worked in industries with transportation and related activities as their primary business. U.S. and Canadian data are based on the number of employees. Mexican data are based on the number of full-time employment positions.

### **Canada**

Statistics Canada. *Employment, Earnings and Hours—Payrolls and Hours, Catalogue no. 72-002-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue no. 53-215-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Transport Canada. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

*Data source:* The monthly Statistics Canada, *Survey of Employment, Payrolls and Hours* (SEPH), is designed to provide monthly estimates to measure levels and month-to-month trends in employment by industry. The data are compiled for the payroll employment,

payrolls and hours from which different variables such as employment, average weekly and hourly earnings and average weekly hours, for Canada, provinces and territories at detailed industrial levels, are derived. The target population is composed of all employers in Canada, except those primarily involved in agriculture, fishing and trapping, private household services, religious organizations and defense services.

The SEPH draws its sample from the Business Register (BR) and from a list of all payroll deduction accounts maintained by Revenue Canada. The Business Register is a list of all businesses in Canada and is updated each month using data from various surveys, business profiling and administrative data maintained by the Business Register Division of Statistics Canada. The payroll deduction source represents all employers with remittances for employee income taxes, Canada/Québec Pension Plan and employment insurance contributions. The survey methodology is based on a census of establishments within an enterprise with a complex structure having more than 300 employees and on sample data from establishments within an enterprise with a simple or with complex structure having less than 300 employees. Data represent annual averages that are weighted and refer to 1 week out of each month.

*Industry employment categories:* Industries are defined at the three-digit level of Canada's Standard Industry Classification (SIC) of 1980. For comparability with Mexican and U.S. data, employment categories may have been rearranged and terminology may be different. For categories under *Local and Inter-urban Passenger*, data were obtained from the four-digit SIC 80 level from transportation surveys.

*Employed labor force:* Employed labor force figures in Table 2-4 differ from those in Tables 1-1 and 2-5. National labor force figures in this table represent the total employed civilian labor force. This figure differs from the data for Canadian labor force in Table 1-1 because it includes only those that are currently employed among the civilian Canadian labor force. In contrast, the data in Table 1-1 represent those individuals in the civilian labor force that are both employed and unemployed. Data for the employed labor force in Table 2-4 also differ from the data for employed labor force in Table 2-5. This is because Table 2-4 is based on one survey, the SEPH, while Table 2-5 is based on a different survey, the Labor Force Survey (LFS). The SEPH is based on a business survey of Canadian employers while the LFS is based on a household survey. Because of this and other methodological differences, the total for employed labor force differs between Table 2-4 and 2-5. For additional information, call the SEPH inquiry line at (613) 951-4090 or the Labor Statistics Division of Statistics Canada at (613) 951-4168.

### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Aguascalientes, Ags.: 1997).

Poder Ejecutivo Federal. *Informe de Gobierno*, various years. (Mexico City, D.F.: various years).

*Data source:* Data are a simple average of the 12-month period and are not a count of the number of people employed in economic activities, but rather an estimate of the number of positions required by each economic activity to carry out its economic production.

*Employed labor force:* Labor force data in this table do not agree with that of Table 1-1 (National Population and Labor Force) because the data sources for the two tables differ in their objectives and methodologies. Data in Table 1-1 are from the *Encuesta Nacional de Empleo (National Employment Survey)*, and represent the “población económicamente activa” (economically active population). (The economically active population is anyone 12 years of age or older.) Data for employed labor force in Table 2-4 are from the *Sistema de Cuentas Nacionales de México* (National Account System of Mexico) and refer to the number of people employed and under payroll.

### United States

Data used in Table 2-4 are compiled by the Bureau of Transportation Statistics (BTS) based on employment data from the Bureau of Labor Statistics and other sources. This table is based on the following primary sources:

Employed labor force, total: U.S. Department of Labor. Bureau of Labor Statistics. *Household Data Annual Averages, 1998*. Table 1. (available at BLS web site: [www.stats.bls.gov](http://www.stats.bls.gov))

Private Employment (Transport Sectors, Transportation Vehicle and Equipment Manufacturing and Related Industries):

1990, 1995: U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation based on data from U.S. Department of Labor. Bureau of Labor Statistics. *National Employment, Hours and Earnings, United States, 1988-1996*. (Washington, DC: various years). SIC 45.

1996: U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation based on data from U.S. Depart-

ment of Labor. Bureau of Labor Statistics. *National Employment, Hours and Earnings, United States, June 1997*. (Washington, DC: 1997). Table B-12.

#### Government employment:

##### *Federal:*

1990, 1995: U.S. Department of Transportation. Office of the Secretary. *DOT Employment Facts, A Report to Management*. (Washington, DC: various years).

1996: U.S. Department of Transportation. Office of the Secretary. *DOT Workforce Facts*, October 1, 1995 through September 30, 1996. (Washington, DC: 1997).

##### *State and local:*

1990: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States, 1998*. (Washington, DC: 1998). Table 531.

*Data source:* Employment by industry data are from the *National Employment, Hours, and Earnings* published by the Bureau of Labor Statistics (BLS), U.S. Department of Labor, which is a product of the *Current Employment Statistics* (CES) or establishment survey program. The CES is a monthly survey conducted by state employment security agencies in cooperation with the BLS. The survey provides employment, hours and earnings estimates based on payroll records of business establishments. Data represent annual employment averages, which are arithmetic averages of the 12 monthly estimates for a particular year.

The Bureau of Labor Statistics (BLS) does not publish data reliability information along with estimates. Instead, it provides estimation formulas and the necessary parameters so that users can estimate standard errors

for estimates of their interest. For additional information, see the "Explanatory Notes and Estimates of Error" in the BLS monthly publication *Employment and Earnings*.

*Industry categories:* School bus employment data do not include drivers employed by school districts. Transportation services in this table largely include services industries involved in arranging passenger and freight transportation, such as travel agencies and freight forwarders. The category of other transportation equipment includes motorcycles, bicycles, tanks and tank components. Federal Department of Transportation employment represents full and part-time civilian and Coast Guard employees. State and local government employment represents highway employment only.

*Employed labor force:* National labor force figures in this table represent the total employed civilian labor force. This figure differs from the data for U.S. labor force in Table 1-1 because it includes only those that are currently employed among the civilian U.S. labor force. In contrast, the data in Table 1-1 represent those individuals in the civilian labor force that are both employed and unemployed.

#### **Table 2-5** **Employment in Transportation- Related Occupations**

##### **All Countries**

Employment by occupation groups provides employment information according to the nature of a particular job. For example, since truck driving is a transportation activity, a truck driver employed by a retail company (such as a grocery store) is counted in the employment of transportation occupations, but *is not* counted in the employment of trans-



portation industries (because a retail company such as a grocery store is not considered part of the transportation sector.)

Table 2-5 shows how many people (employees) worked in positions unique to transportation such as a truck driver, throughout the economy, including transportation and nontransportation industries. U.S. and Canadian data are based on the number of employees. Mexican data are based on the number of employment positions.

### Canada

Statistics Canada. *Historical labor force statistics, Catalogue no. 71-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

*Data source:* The Statistics Canada *Labor Force Survey (LFS)* is a household survey carried out monthly by Statistics Canada. The objectives of the LFS are to divide the working-age population into three mutually exclusive classifications (employed, unemployed and not in the labor force) and provide description and explanatory data on each of these categories. Data from the survey provide information on major labor market trends such as shifts in employment across industrial sectors, hours worked, labor force participation and unemployment rates.

On a monthly basis, the LFS surveys a sample of individuals who are representative of the civilian, noninstitutional population 15 years of age or older in Canada's ten provinces. Specifically excluded from the survey's coverage are residents of the Yukon and Northwest Territories, persons living on Indian Reserves, full-time members of the Canadian armed forces and inmates of institutions. These

groups together represent an exclusion of approximately 2 percent of the population aged 15 or older. Data represent annual averages that are weighted and refer to 1 week out of each month.

*Occupation categories:* Employment categories are based on Canada's 1980 Standard Occupation Classification (SOC). For comparability with Mexican and U.S. data, employment categories may be rearranged and terminology may be different.

*Employed labor force:* Employed labor force figures in Table 2-5 differ from those in Tables 1-1 and 2-4. National labor force figures in this table represent the total employed civilian labor force. This figure differs from the data for Canadian labor force in Table 1-1 because it includes only those that are currently employed among the civilian Canadian labor force. In contrast, the data in Table 1-1 represent those individuals in the civilian labor force that are both employed and unemployed. Data for the employed labor force in Table 2-5 also differ from the data for employed labor force in Table 2-4. This is because Table 2-5 is based on one survey, the LFS, while Table 2-4 is based on a different survey, the Survey of Employment, Payrolls and Hours (SEPH). The LFS is based on a household survey while the SEPH is based on business survey of Canadian employers. Because of this and other methodological differences, the total for employed labor force differs between Table 2-5 and 2-4. For additional information, call the LFS inquiry line at (613) 951-4090 or the Labor Statistics Division at Statistics Canada at (613) 951-4168.

### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Contabilidad



Nacional, Estudios Socioeconómicos y Precios. *Sistema de Cuentas Nacionales de México, 1988-1996*. (Mexico City, D.F.: 1997).

Also see notes for Table 2-4 for employed labor force. Data on transportation employment by occupation are nonexistent, except for taxi cab drivers and chauffeurs.

**United States**

Data used in this table are compiled by the Bureau of Transportation Statistics (BTS) based on employment data from the Bureau of Labor Statistics. This table is based on the following primary sources:

U.S. Department of Labor. Bureau of Labor Statistics. *Household Data Annual Averages*. Table 1. (Available at BLS web site: stats.bls.gov)

U.S. Department of Labor. Bureau of Labor Statistics. *Employment and Earnings*. Table 11 of the Annual Averages Tables, January issues (1984-1997), and BLS underlying statistical details. (Washington, DC: various years).

*Data source:* Employment by occupation data are from *Employment and Earnings*, a monthly publication of the Bureau of Labor Statistics (BLS). The data source of *Employment and Earnings* is the *Current Population Survey*, a monthly household survey conducted by the Census Bureau for the BLS. The *Current Population Survey* provides a comprehensive body of information on the employment and unemployment experience of the U.S. population, classified by age, sex, race, and a variety of other characteristics.

Annual employment averages are arithmetic averages of the 12 monthly estimates for a particular year. The BLS does not publish data reliability information along with estimates. Instead, it provides estimation formu-

las and the necessary parameters so that users can estimate standard errors for estimates of their interest. For additional information, see the “Explanatory Notes and Estimates of Error” in *Employment and Earnings*.

*Employed labor force:* National labor force figures in this table represent the total employed civilian labor force. This figure differs from the data for U.S. labor force in Table 1-1 because it includes only those that are currently employed among the civilian U.S. labor force. In contrast, the data in Table 1-1 represent those individuals in the civilian labor force that are both employed and unemployed.

**Table 2-6**  
**Receipts and Payments Related to**  
**International Merchandise and**  
**Services Trade**

(Current U.S. dollars)

**All countries**

Tables 2-6 through 2-8b contain data on international merchandise and service trade for the three countries. At the aggregate level, the data categories in these tables can be considered conceptually comparable across the countries. However, each country has also chosen to use its own data for international merchandise and services trade. For example, Table 2-7b reports Canadian trade with the United States, according to Canadian data sources. Table 2-8a reports U.S. trade with Canada, according to U.S. data sources. Differences between these data sources are caused by differences in definitions, methodologies and statistical sources, among the three countries. Also note that detailed data for Mexico were not available. Therefore, no Mexican tables have been included showing trade with Canada and the U.S., according to Mexican data

sources. Merchandise trade data by country, value, weight, mode of transportation, port and commodity description are included in Sections 6 and 7.

### Canada

Statistics Canada. *Canada's Balance of International Payments, Catalogue 67-001-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

#### *Definitions of merchandise and services trade:*

For this table, the definitions of goods and services are those utilized and defined by the Canadian Balance of Payments (BOP). Under this framework, goods are defined as exports and imports that are valued at the border of the exporting economy. That is, the valuation of goods includes transportation costs to the border. Inland freight charges are recorded as an adjustment to Canadian Customs trade data. Goods also include all goods that cross the border to be processed. Together with the inland freight adjustment to Canadian Customs trade data, additional adjustments are made for timing, coverage and other valuation and residency.

All services definitions were restated in May 1996 according to international norms first issued by the International Monetary Fund (IMF) in 1993 and extended jointly by the IMF, the OECD and the statistical arm of the European Union, Eurostat. The redefined services include the following categories: travel, transportation, commercial and government services. However, for the purposes of Table 2-6, 2-7a and 2-7b, Canadian data have been represented in the two major categories of transportation and tourism and other services. The Canadian data category "travel" is included in the tourism category for these

tables, and the Canadian categories of "commercial and government services" are included in the other services category for these tables.

*Merchandise exports:* Merchandise exports data in this table are based on Canadian Customs export data that are published by the International Trade Division of Statistics Canada. Canadian Customs exports to overseas countries are valued f.o.b. (free on board) port of exit. Canadian Customs exports to the United States are valued f.o.b., point of exit (at the border). Customs data therefore, include inland freight charges, but these are removed from the Balance of Payment data, as a negative adjustment to the trade. A new Balance of Payments estimate for inland freight is then added to the exports, which are valued at plant basis. (Valued at plant basis means the value of goods f.o.b. (free on board) at the place of lading; i.e., at the point of production for the majority of commodities.) Other Balance of Payments adjustments include adjustments for valuation, residency, timing and coverage.

*Merchandise imports:* Merchandise imports data in this table are based on Canadian Customs import data that are published by the International Trade Division (ITD) of Statistics Canada. For Table 2-6, Canadian customs imports are valued f.o.b., based on the place of direct shipment to Canada. Although it does not make any difference at the aggregate level, import data released by Statistics Canada's Balance of Payments and International Trade Divisions are different on a geographical basis. The International Trade Division records the imports according to a country of origin basis while the Balance of Payments Division reports imports on a country of last consignment basis.



*Transportation services:* Transportation services cover receipts and payments related to the transportation of persons and goods by air, water and land, together with supporting services for the various modes of transport. Receipts cover passenger fares received by Canadian carriers (primarily air) from nonresidents; services of carriers operated by Canadian residents (ocean ships, lake vessels, aircraft, rail and trucks) that transport merchandise exports beyond the borders of Canada; carriers operated by Canadian residents engaged in the transportation of commodities between foreign countries (including intransit movement and transit between U.S. points via Canada); income from the charter of vessels; and port expenditures in Canada by nonresidents air and shipping companies. Payments cover passenger fares paid to nonresident carriers (chiefly air) by Canadian residents. The data also include most outlays on cruises although such outlays should in principle be assigned to travel. Payments also cover the transport by nonresident carriers of imports into Canada (excluding inland freight charges in the United States and other countries); the transport of Canadian commodities in transit through the United States (in particular oil and natural gas); the charter of foreign vessels; and port expenditures abroad by Canadian resident air and shipping companies.

*Tourism and other services:* Data for tourism cover all receipts and payments arising from the travel of less than 1 year between Canada and other countries, and for travel of more than 1 year for educational or health purposes. Travelers of more than 1 year are otherwise treated as residents of the country to which they travel except for diplomats and military personnel on postings abroad. Data for other services include government ser-

vices for international transactions arising from government activities (diplomatic, commercial and military) not covered elsewhere in the Balance of Payments. Receipts for this category chiefly comprise expenditures in Canada by foreign governments. Payments for this category mainly cover expenditures abroad of both the Canadian federal and provincial governments. Other services also include receipts and payments for commercial services.

### **Mexico**

Banco de México. *Indicadores Económicos*. (Mexico City, D.F.: 1998).

Data are based on the Banco de Mexico's Balance of Payments, Current Account framework. Transactions of the maquiladora industry are included in services and merchandise trade for 1995 and 1996, but *not* for 1990. For the category Merchandise Exports, export valuation is made on an FOB basis; i.e., the value of the goods at their point of origin, plus freight, insurance and other costs to move the goods to the outbound customs house. For the category Merchandise Imports, imports are valued on an FOB basis; i.e., market value of the goods at the point of origin, plus freight, insurance and other expenses to move the goods to the inbound customs house. For the category Tourism and Other Services, tourism includes expenditures by tourists, including people on day-excursions (i.e., those tourists who do not stay overnight). The category Transportation includes costs of freight and insurance.

### **United States**

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. (Washington, DC: September 1993, July 1996, and October 1997).

U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).

*Merchandise exports and imports:* Exports exclude goods exported under U.S. military agency sales contracts identified in the U.S. census export data. Imports exclude goods under direct defense expenditures identified in the U.S. census import data. Merchandise imports are valued according to the "Customs value," which represents the value of merchandise for duty (or Customs) purposes. (Thus, the Customs value is usually the selling price in the foreign country of origin, and *excludes* freight costs, insurance and other charges incurred in bringing the merchandise from the foreign port of export to the United States.) For exports to all countries except Canada, export values represent the reported value of the merchandise, usually the selling price, plus insurance, inland freight costs and other charges incurred in bringing the merchandise to the U. S. port of export. This is generally called the f.a.s. (free alongside ship) value. Because the United States does not collect information for U.S. exports to Canada from its own trade documents, the value of these exports represents the transaction value of the merchandise, plus a Statistics Canada *imputed* estimate of the costs of insurance, inland freight and other charges.

*Trade adjustments, total:* The Bureau of Economic Analysis (BEA) at the Department of Commerce makes several adjustments to U.S. merchandise trade data when these are incorporated in the U.S. Balance of Payments. These include adjustments for inland freight charges and other adjustments made for valuation, residency, timing and coverage purposes. Inland freight adjustments are made to U.S. data for merchandise imports

from Canada because the Customs value of imports for certain Canadian goods is the point of origin in Canada rather than the port of export in Canada. Since the reported value of U.S. exports includes inland freight costs, no adjustments are needed, except for U.S. exports to Canada. Because the United States does not collect information for U.S. exports to Canada from its own trade documents, the value of these exports represents the transaction value of the merchandise, plus a Statistics Canada *imputed* estimate of the costs of insurance, inland freight and other charges. The Statistics Canada estimate is based on 4.5 percent of the export merchandise transaction value.

*Total services:* Total services data include total transactions in services, including private services, U.S. government miscellaneous services and some goods. Export services also include transfers under U.S. military agency sales contracts. Import services also include direct defense expenditures. Private services included in the total services category consist of the following categories in the U.S. Balance of Payments: (1) travel, (2) passenger fares, (3) other transportation, (4) royalties and license fees and (5) other private services.

*Transportation services:* Transportation services data include passenger fares paid by residents of one country to airline and vessel operators who reside in another country. Exports consist of fares received by U.S. operators for transporting foreign residents between the United States and a foreign country and between foreign countries. Imports consist of fares paid to foreign operators by U.S. residents for travel to and from the United States. The rest of transportation services include transactions for freight and port



services for the transportation of goods by water, air and land to and from the United States. Freight receipts of U.S. carriers are for transporting U.S. goods between two foreign points; freight payments to foreign carriers are for transporting U.S. merchandise imports. Port services receipts are the value of the goods and services procured by foreign carriers in both U.S. ocean and air ports; port services payments are the value of goods and services procured by U.S. carriers in foreign ocean and air ports. The land transportation receipts and payments cover U.S. transactions with Canada and Mexico through trucks, rail and pipelines. However, trucking operations between the United States and Mexico are currently limited by regulation.

*Tourism and other services:* Tourism and other services data are based on a compilation of the following categories in the U.S. balance of payments account: travel, passenger fares, other transportation, royalties and license fees, other private services and government services. Tourism is not a separate category in these accounts. Therefore, the number for this entry is the difference between total services and transportation.

**Tables 2-7a and 2-7b**  
**Canada's Receipts From and Payments to Mexico for Merchandise and Services Trade**

**Canada's Receipts From and Payments to the United States for Merchandise and Services Trade**

(Current U.S. dollars)

**Canada**

Statistics Canada. *Canada's Balance of International Payments, Catalogue 67-001-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Tables 2-7a and 2-7b contain import data based on customs origin and based on consignment. The category, *Imports, Customs Origin*, are those imports that are attributed to their country of origin; that is, the country in which the goods were grown, extracted or manufactured in accordance to the rules of origin administered by Revenue Canada, Customs and Excise. The category, *Imports, Consignment* are those imports that are attributed to their last country of consignment. This valuation is done for Balance of Payment purposes and better reflects the notion of change of ownership.

**Tables 2-8a and 2-8b**  
**U.S. Receipts From and Payments to Canada for Merchandise and Services Trade**

**U.S. Receipts From and Payments to Mexico for Merchandise and Services Trade**

(Current U.S. dollars)

**United States**

U.S. Department of Commerce. Bureau of Economic Analysis. *Survey of Current Business*. September 1993, July 1996 and October 1997. (Washington, DC: various years).

U.S. Department of Commerce. Bureau of Economic Analysis. *1998 Annual Services Historical Disk*. (Washington, DC: 1998).

See note for Table 2-6 for an additional explanation of similar data elements. However, note that total services in Tables 2-8a and 2-8b include only private services. Data were not available for government services because the government services data are not reported at the level of individual countries.

## SECTION 3: TRANSPORTATION SAFETY

### Tables 3-1 and 3-2

#### Transportation Fatalities by Mode Transportation Injuries by Mode

##### All Countries

**Air:** United States and Canada include fatalities and injuries from both passenger and all-cargo flights. Mexico includes fatalities from passenger flights only. For the U.S. and Canada, the air carrier data represent their own national flag carriers, operating both domestic and international flights.

**Road:** The United States and all Canadian provinces and territories, with the exception of the province of Québec, count all fatalities that occur within 30 days of the accident (and can be attributed to the accident). Canada's Province of Québec counts all fatalities that occur within 8 days of the accident (and can be attributed to the accident). Mexico counts only fatalities at the site of the accident. In the U.S., the 30-day rule was initiated for fatalities from road crashes in September 1978, and a consensus to apply this rule across all modes was formulated in 1995.

**Water transport:** U.S. and Canadian data are not comparable in several respects. First, the United States counts fatalities and injuries from vessel casualties for U.S. flag vessels *anywhere in the world*, and for foreign flag vessels within the jurisdiction of the United States. The Canadian data include only Canadian and foreign flag vessels operating in Canadian waters. Second, the Canadian data exclude all fishing vessels, except factory ships; the United States data include fishing vessels. (See the entries under Canada and the United States, below, for more complete definitions.)

## Canada

Tables 3-1 and 3-2 are based on the following primary sources:

**Air:** Transportation Safety Board of Canada. (TSB) Special tabulation. (Ottawa, Ont.: 1998).

**Road:** Transport Canada. Road Safety and Motor Vehicle Regulation. *Traffic Accident Information Database*. Special tabulation. (Ottawa, Ont.: 1998).

**Pipeline:** Transportation Safety Board of Canada. (TSB) Special tabulation. (Ottawa, Ont.: 1998).

**Rail:** Transportation Safety Board of Canada (TSB). Minister of Public Works and Government Services. *TSB Statistical Summary: Railway Occurrences—1997*. (Ottawa, Ont.: 1998).

**Water, Commercial Passenger and Freight Vessels:** Transportation Safety Board of Canada (TSB). Minister of Public Works and Government Services. *TSB Statistical Summary: Marine Occurrences—1997*. (Ottawa, Ont.: 1998).

**Water, Recreational Boats:** Canadian Red Cross. Special tabulation. (Ottawa, Ont.: 1998).

The following definitions apply for air, rail and water data in Tables 3-1 through 3-4. Technical notes for Canadian data in Tables 3-1 and 3-2 adhere to these definitions.

**Aviation accident:** A reportable aviation accident is an accident resulting directly from the operation of an aircraft where a person sustains a serious injury or is killed as a result of: being on board the aircraft; coming into contact with any part of the aircraft or its contents; being directly exposed to the jet blast or rotor down-wash of the aircraft; the aircraft sustaining damage that adversely

affects the structural strength, performance or flight characteristics of the aircraft and that requires major repair or replacement of any affected component part; or the aircraft is missing or inaccessible.

*Serious air injury:* A serious air injury is an injury that is sustained by a person in an accident and that: requires hospitalization for more than 48 hours, commencing within 7 days of the date that injury was received; results in a fracture of any bone (except simple fractures of fingers, toes or nose); involved lacerations that cause severe hemorrhage, nerve muscle, or tendon damage; involves injury to any internal organ; or involves second or third degree burns, or any burns affecting more than 5 percent of the body surface; involves verified exposure to infectious substances or injurious radiation.

*Railway accident:* A reportable railway accident is one resulting directly from the operation of rolling stock, where: (1) a person sustains a serious injury or is killed as a result of being on board or getting off the rolling stock or coming into contact with any part of the rolling stock or its contents; or (2) the rolling stock is involved in a grade-crossing collision, is involved in a collision or derailment and is carrying passengers; is involved in a collision or derailment and is carrying dangerous goods, or is known to have last contained dangerous goods the residue of which has not been purged from the rolling stock; sustains damage that affects its safe operation; or causes or sustains a fire or explosion, or causes damage to the railway, that poses a threat to the safety of any person, property or the environment.

*Serious rail injury:* A serious rail injury is one that is likely to require admission to a hospital.

*Marine accident:* A reportable marine accident means an accident resulting directly from the operation of a ship other than a pleasure craft, where a person sustains a serious injury or is killed as a result of: being on board the ship or falling overboard from the ship, or coming into contact with any part of the ship or its contents, or the ship sinks, founders or capsizes, is involved in a collision (which includes collisions, strikings or contacts), sustains a fire or an explosion, goes aground, sustains damage that affects its seaworthiness or renders it unfit for its purpose, or is missing or abandoned. In this definition, “ship” includes: a) every description of vessel, boat or craft designed, used or capable of being used solely or partly for marine navigation without regard to method or lack of propulsion. For statistical purposes, these accidents are classified as “accidents aboard ship.” In addition, the definition of “ship” also includes dynamically supported craft. For statistical purposes, these are classified as “shipping accidents.” “Pleasure craft” means a vessel that is used for pleasure or recreation and does not carry goods or passengers for hire or reward.

*Air:* Data in Tables 3-1 and 3-2 comprise fatalities and injuries on Canadian aircraft involved in accidents in domestic and international airspace. Passenger and all-cargo flights are included. Scheduled and nonscheduled flights are included. Fatalities and injuries that occur on the ground are excluded from the statistics.



*Air carrier:* Air carrier data in Tables 3-1 and 3-2 are compiled according to regulatory definitions of registered aircraft types established by the Transportation Safety Board of Canada and include the following types of Canadian registered aircraft used by Canadian air operators that offer a “for-hire” service to transport people or goods, or to undertake specific tasks such as aerial photography, flight training and crop spraying:

- (1) An **airliner** is an airplane used by a Canadian air operator in an air transport service or in aerial work involving sightseeing operations, that has a maximum take-off weight (MCTOW) of more than 8,618 kg (19,000 pounds) or for which a Canadian-type certificate has been issued authorizing the transport of 20 or more passengers.
- (2) A **commuter aircraft** is an airplane used by a Canadian air operator, in an air transport service or in aerial work involving sightseeing operations, of any of the following aircraft: a) a multi-engined aircraft that has a maximum take-off weight (MCTOW) of more than 8,618 kg (19,000 pounds) and a seating configuration, excluding pilot seats, of 10 to 19 inclusive; or b) a turbo-jet-powered aeroplane that has a maximum zero fuel weight of 22,680 kg (50,000 pounds) or less and for which a Canadian type certificate has been issued authorizing the transport of not more than 19 passengers.

- (3) An **air taxi or specialty aircraft** is an airplane used by a Canadian operator on an on-hire basis that does not satisfy the definition of an airliner or a commuter aircraft. Air carrier data also may include fatalities and injuries from charter aircraft operations.

Air data in Table 3-1 and Table 3-2 include fatalities and injuries that occurred on all passenger and cargo flights of Canadian registered aircraft during 1990, 1995 and 1996, operating domestically and internationally. The numbers of fatalities and injuries that occurred on cargo flights of Canadian registered aircraft during 1990, 1995 and 1996 are as follow:

Year	Fatalities	Injuries
1990	0	1
1995	0	0
1996	4	0

**Note:** In 1991, there was one fatality/injury-type air accident in the Province of Québec involving a Canadian registered cargo aircraft (Reference: Transportation Safety Board of Canada Occurrence Number 91Q0150). This air accident had one air fatality and one air injury.

*General aviation:* General aviation data in Tables 3-1 and 3-2 are compiled according to regulatory definitions established by the Transportation Safety Board of Canada and includes fatalities and injuries on ultra-light aircraft, private and commercial helicopter operations and from flights that do not transport people or cargo on a “for-hire” basis.



Below are the specific details of those air accidents involving cargo flight of Canadian registered aircraft during 1990, 1995 and 1996:

Occurrence number	Occurrence date	Province of occurrence	Number of fatalities	Number of injuries
90Q0119	05/19/90	Québec	0	1
A95Q0144	07/28/95	Québec	0	0
A96A0134	07/22/96	Newfoundland	3	0
A96P0175	08/14/96	British Columbia	1	0

**Note:** In 1995, there was one air accident, which occurred in the Province of Québec (Reference: Transportation Safety Board of Canada Occurrence Number A95Q0144) involving a Canadian registered cargo aircraft for which there was extensive damage reported to the aircraft, but no fatalities or injuries.

*Road:* Road data for passenger cars and light trucks include statistics for automobiles and light trucks (pick-ups, sports utility vehicles and mini-vans). Motorcycle data include both mopeds and motorcycles. Data for heavy trucks include straight trucks greater than 4,536 kilograms, (a straight truck has a configuration where both the vehicle's power unit and cargo storage unit share the same chassis), tractor-trailers and other unspecified trucks. Road data for other types of road injuries and fatalities include all other vehicle types and nonvehicle occupants involved in a motor vehicle traffic collision. Road data for Canadian motor vehicle fatalities and injuries are derived from the Canadian Traffic Accident Information Database (TRAID). TRAID is a collection of data pertaining to traffic collisions provided annually to Transport Canada by Canada's ten provinces and three territories. These collisions are all those deemed reportable; i.e., they occur on public roads and incur bodily harm and/or property damage exceeding a stipulated dollar threshold. This threshold is determined independently by each provincial and territorial jurisdiction.

The accident segment contains general data about the accident scene such as road conditions and summary accident statistics such as the total number of persons killed. Each accident within each province and each calendar year has a unique case number. The vehicle segment contains vehicle specific data such as the vehicle type and the vehicle actions prior to and during the collision. Each vehicle involved in the collision will have a separate vehicle segment. Therefore, if there are two vehicles involved there will be two different vehicle segments associated with that collision. Each of these vehicles will have a unique vehicle identification number.

*Pipeline:* Pipeline data in Table 3-2 include both minor and serious injuries for 1990. Only serious injuries are included for 1995 and 1996.

*Rail:* Rail data for Table 3-2 include both minor and serious injuries for 1990. Only serious injuries are included for 1995 and 1996.

*Water transport, commercial:* Water data for both commercial passenger vessels and commercial freight vessels include both Canadian and foreign flag vessels operating in Canadian waters. Data for commercial passenger vessels include, e.g., cruise ships and ferries. Data for commercial freight vessels include cargo/container, bulk carrier/OBO (Ore-Bulk-Oil) carrier, tanker, tug, barge/pontoon and ferry vessels. Data for commercial freight vessels exclude all fishing vessels, except factory ships, as well as research vessels, oil exploration and support ships.

*Water transport, recreational boats:* Water data for recreational boating include drownings from recreational, daily living, occupational, rescue and unknown purposes, as well as other fatal boating injuries including immersion, hypothermia, collisions and propeller injuries. The source for this information is the Canadian Red Cross. Fatalities for 1990, and injuries for 1990 through 1996, are nonexistent.

### **Mexico**

*Air:* Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998). Special tabulation.

*Road and rail:* Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad and their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

*Road (in areas under federal jurisdiction):* Secretaría de Comunicaciones y Transportes. Dirección General de Policía Federal de Caminos y Puertos. (Mexico City, D.F.: 1998).

*Air:* Data represent fatalities and injuries arising from general aviation accidents or incidents recorded within Mexico, and include passenger and crew fatalities and injuries at the site of the accident. All-cargo flights are not included, although the number of fatalities and injuries from all-cargo flights is estimated to be small.

*Road:* In Table 3-1, data refer to fatalities in fatal accidents; i.e., where one or more people died at the site of the accident. In Table 3-2, data refer to people injured in an accident; i.e., where one or more people were injured, with or without fatalities. The numbers assigned by type of vehicle refer only to accidents in urban and suburban areas. For accidents in zones of federal jurisdiction, no breakdown by type of vehicle is available, but the fatalities and injuries are included in the overall totals for road. Therefore, the road subcategories will not sum to the overall road totals for fatalities and injuries. The subcategory of "other" includes accidents in trolley buses, trams, bicycles and others.

*Rail:* Data include only fatalities and injuries from accidents in urban and suburban zones.

### **United States**

Tables 3-1 and 3-2 are based on modifications of similar tables (including adjustments to definitions) published in the U. S. Department of Transportation, Bureau of Transportation Statistics. *National Transportation Statistics 1998.(NTS-98)* (Washington, DC: 1998) and *National Transportation Statistics 1999 (NTS-99)* (Washington, DC: 1999).

Tables 3-1 and 3-2 are based on the following primary sources:

*Air:* National Transportation Safety Board. *Aviation Accident Statistics*. Web site: [www.nts.gov/aviation/Stats.htm](http://www.nts.gov/aviation/Stats.htm)

National Transportation Safety Board. *Accident Synopses*. Web site: [www.nts.gov/aviation/Accident.htm](http://www.nts.gov/aviation/Accident.htm)

National Transportation Safety Board. *Annual Review of Aircraft Accident Data*, annual issues and *NTSB Press Release, SB97-03*. (Washington, DC: various years). (fatalities)

National Transportation Safety Board. Analysis and Data Division, RE-50. (Washington, DC: various years). (injuries)

See also: U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. (Washington, DC: 1997). Chapter 9. Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

Road: U.S. Department of Transportation. National Highway Traffic Safety Administration. National Center for Statistics and Analysis. *Fatality Analysis Reporting System (FARS)*, and, for injuries, *the General Estimates System (GES)*, 1998. (Washington, DC: 1998).

U.S. Department of Transportation. National Highway Traffic Safety Administration. *Traffic Safety Facts*, 1997. (Washington, DC: November, 1998).

Pipeline (liquid and gas): U.S. Department of Transportation. Research and Special Projects Administration. Office of Pipeline Safety, DPS-35. (Washington, DC: 1998).

Rail: Highway grade crossing: U.S. Department of Transportation. Federal Railroad Administration. *Rail-Highway Crossing Accident/Incident and Inventory Bulletin*. (Washington, DC: various years). Table S.

Railroad: U.S. Department of Transportation. Federal Railroad Administration. *Accident/Incident Bulletin*. (Washington, DC: various years). Table 7.

Transit: Transit rail: U.S. Department of Transportation. Federal Transit Administration. *Safety Management Information Statistics (SAMIS)*. (Washington, DC: various years).

Water: Commercial freight and passenger Vessels: U.S. Department of Transportation. U.S. Coast Guard. Office of Investigations and Analysis. Compliance Analysis Division, G-MOA-2. (Washington, DC: 1998).

Recreational boating: U.S. Department of Transportation. U.S. Coast Guard. Office of Investigations and Analysis. Compliance Analysis Division. *Boating Statistics*. (Washington, DC: various years).

*Cross-modal comments*: For 1995 and 1996, a death is attributed to a transportation incident if the death occurred up to 30 days after the incident. For 1990, this may not be true for all modes, but this definition has applied in the Road mode since September of 1978.

Caution must be exercised in comparing U.S. fatalities (and injuries) across modes, because significantly different definitions for reportable **events** are used among the modes. In particular, rail and transit fatalities and injuries include deaths and injuries that are not, strictly speaking, caused by transportation accidents, but are caused by such events as a fall on a transit station escalator, or, for railroad employees, a fire in a workshed. Similar fatalities for the air and highway modes (deaths at airports not involving aircraft, or fatalities from accidents in automobile repair shops) are not counted towards the totals for these modes. Counting fatalities not necessarily directly related to transportation potentially overstates the risk for the rail and transit modes. For the waterborne mode, fatalities from vessel casualties are counted in the total, and other



fatalities are not counted. (Vessel casualties are incidents involving damage to vessels, for example, from collisions, groundings, fires or explosions.) Fatalities not from vessel casualties include, for example, deaths from accidents involving on-board equipment. Thus, fatalities for the waterborne mode are potentially understated. (Everything stated above about fatalities also applies to injuries.) In addition to the modal differences for definitions of reportable events, definitions of reportable injuries also vary among the modes. See the *National Transportation Statistics (NTS)-99* or the *NTS-98* for a description of what constitutes a reportable injury for each mode.

In addition, it should be emphasized that the numbers for total fatalities and injuries are less than the sum of the modal totals for the United States because some deaths (injuries) are reported and counted in more than one mode. To avoid double counting, the following components **have been counted only once** in arriving at the overall totals shown in Tables 3-1 and 3-2:

- (1) Rail-highway grade crossing fatalities (injuries) involving motor vehicles: These are counted in both the rail and road modes, and are included in both modal totals.
- (2) Commuter rail fatalities (injuries) arising from *incidents*: These are counted in both the rail and the transit modes, and are included in both modal totals.
- (3) Motor bus fatalities (injuries) arising from *accidents*: These are counted in both the road and the transit modes, and are included in both modal totals.

- (4) Demand response and vanpool fatalities (injuries) arising from *accidents*: These are counted in both the road and the transit modes, and included in both modal totals.

For additional information, refer to Table 3-4 in the *National Transportation Statistics—1998* or the *National Transportation Statistics—1999* to see exactly how these adjustments have been made to the 1995 and 1996 fatality totals. Note that *incidents include accidents; that is, accidents are a subset of incidents*. See below under the individual modal comments on transit and rail for more complete definitions of incidents and accidents. Data on highway-rail grade crossing fatalities and injuries that involved motor vehicles are provided in the annual issues of the Federal Railroad's Administration's *Highway-Rail Crossing Accident/Incident and Inventory Bulletin*. (See above for the full citation.) Data on transit accidents and incidents by submode are provided in the *National Transportation Statistics, 1999*, Tables 3-28 and 3-29.

*Air*: Air carriers include all U.S. flag carriers, comprising both scheduled and nonscheduled flights, both domestic and international flights, and both passenger and all-cargo flights. Commuters and on-demand air taxis are included. In Table 3-2, only "serious injuries" are reported. (See the *National Transportation Statistics (NTS)-1999* or the *NTS-98* for the definition of a serious injury in air accidents.) U.S. air fatality and injury data are based on reports from the National Transportation Safety Board (NTSB). NTSB investigators perform on-site and off-site investigation of all accidents involving U.S. registered air carriers and general aviation aircraft. Federal regulations require operators to notify the NTSB immediately of avia-



tion accidents and certain incidents. According to the NTSB, a reportable accident “is defined as an occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.” Web site: [www.nts.gov/aviation/report.htm](http://www.nts.gov/aviation/report.htm).

As stated above, the air safety data include both passenger and all-cargo flights. The National Transportation Safety Board’s web site at [www.nts.gov/aviation/Accident.htm](http://www.nts.gov/aviation/Accident.htm) does not separate passenger flights from all-cargo flights. However, for flights operating under 14 CFR-121 (aircraft with more than 30 seats or a payload of more than 7,500 pounds), the detailed accident reports available on the web site make it clear which were all cargo flights. For smaller aircraft, particularly on-demand air taxis, it is not possible to infer with confidence how many were all cargo flights from the information available on the web site. **For aircraft operating under CFR-121:**

1990: 6 fatal accidents, of which 2 were all-cargo flights; 39 fatalities, of which 28 occurred as the result of an all-cargo aircraft crash. (Ground fatalities included.)

1995: 3 fatal accidents, of which 2 were all-cargo flights; 168 fatalities, of which 8 occurred as the result of an all-cargo aircraft crash. (Ground fatalities included.)

1996: 5 fatal accidents, of which 2 were all-cargo flights; 380 fatalities, of which 38 occurred as the result of an all-cargo aircraft crash. (Ground fatalities included.)

It should also be noted that during the research phase of this project, a change in regulations occurred. Since March 20, 1997, 14 CFR-121 began to cover some smaller aircraft (i.e., aircraft with 10 or more seats) that were formerly regulated under 14 CFR-135. This change does not affect the data in this publication, because of its 1996 cutoff.

*Road:* The data for passenger cars, light trucks, buses and large trucks are the number of *occupants* of these vehicles who have been killed (injured) in road crashes. In Tables 3-1 and 3-2, *Light Truck* means trucks of 4,536 kg (i.e., 10,000 pounds) gross vehicle weight rating or less, and *Large Truck* means trucks of over 4,536 kg gross vehicle weight rating. Note that these definitions differ from those in some other tables in this publication. Buses include intercity buses, school buses and local transit buses. The subcategory of “other” represents pedalcyclists, other nonoccupants and unknown. See the *National Transportation Statistics (NTS)*-1999 or the *NTS-98* for the definitions of a reportable road injury.

U.S. road fatality data come from the Fatality Analysis Reporting System (FARS), and are compiled by FARS analysts at the regional offices of the U.S. Department of Transportation’s National Highway Traffic Safety Administration (NHTSA). FARS analysts use a census of police accident reports, state vehicle registration files, state drivers licensing files, state highway department data, vital statistics, death certificates, coroner/medical examiner reports, hospital medical reports and emergency medical service reports. A separate form is completed for each fatal crash. Fatality data are continuously collected and electronically submitted to the NHTSA database. Cross verification of police reports with death certificates ensures that

undercounting is rare. The FARS data do not include motor vehicle fatalities on nonpublic roads. However, previous NHTSA analysis has found that these fatalities account for 2 percent or fewer of the total motor vehicle fatalities per year.

U.S. road injury data come from the General Estimates System (GES) of the National Traffic Safety Administration at the U.S. Department of Transportation. The GES data are a nationally representative sample of police reported crashes involving at least one motor vehicle and resulting in injuries, fatalities and property damage in which a police accident report (PAR) was filled out. GES data collectors randomly sample PARs and forward copies to a central contractor for coding into a standard format for the GES system. Documents such as police diagrams or supporting text provided by the officer may be further reviewed to complete the data entry. Various sources suggest that about half of the motor vehicle crashes in the United States are not reported to police and that the majority of these unreported crashes involve minor property damage and no significant personal injury. A NHTSA study of injuries from motor vehicle crashes estimated the total count of nonfatal injuries at over 5 million compared with the GES's estimate of 3.2 million for the same year.

*Pipelines:* U.S. fatality and injury data for pipeline in Tables 3-1 and 3-2 are based on liquid (crude oil and petroleum products) and natural gas pipelines. Each of these is regulated under separate safety regulations by the Office of Pipeline Safety of the Research and Special Projects Administration at the U.S. Department of Transportation. For both liquid and natural gas pipelines, accidents are required to be reported as soon as possible, but no later than 30 days after discovery. Re-

ports are sent to the Federal Office of Pipeline Safety's Information Systems Manager. Possible sources of error include a release going undetected, even if such a release is subsequently detected and reported, it may not be possible to reconstruct the accident accurately.

*Liquid pipelines:* U.S. fatality and injury data for liquid pipelines are derived from reports filed with the Office of Pipeline Safety at the Research and Special Projects Administration, USDOT. These reports are based on regulations that define a reportable accident for liquid pipelines as: "...each failure in a pipeline system... in which there is a release of the hazardous liquid or carbon dioxide transported resulting in any of the following: (a) explosion or fire not intentionally set by the operator; (b) loss of 50 or more barrels of hazardous liquid or carbon dioxide; (c) release to the atmosphere of more than five barrels a day of highly volatile liquids; (d) death of any person; and (e) bodily harm to any person; and (f) estimated property damage to the property of the operators or others, or both, exceeding \$50,000. (For more information, refer to *NTS-98* or *NTS-99*).

*Natural gas pipelines:* U.S. fatality and injury data for natural gas pipelines are based on reports filed with the Office of Pipeline Safety at the U.S. Department of Transportation. These reports conform with regulations from the same office that define a reportable accident for gas pipelines as any of the following events:

- (1) An event that involves the release of gas from a pipeline or liquefied natural gas or gas from an LNG facility and
  - (i) a death, or personal injury necessitating in-patient hospitalization; or

- (ii) estimated property damage, including cost of gas lost, of the operator or others, or both, of \$50,000 or more.
- (2) An event that results in an emergency shutdown of an LNG facility.
- (3) An event that is significant, in the judgment of the operator, even though it did not meet the criteria of paragraphs (1) or (2)."

*Railroad:* Railroad data include intercity passenger, freight rail and commuter rail fatalities and injuries. Note that commuter rail fatalities and injuries also are reported under transit, as explained above in Cross-Modal comments. U.S. railroad fatality and injury data are based on reports that railroads are required to file for each train accident resulting in property damage in excess of \$6,300, each highway-rail accident, and each incident involving the operation of a railroad resulting in a fatality or a reportable injury. These reports cover workers, trespassers and others not on trains in addition to passengers and train crew. For more detail, see the U.S. Department of Transportation, Federal Railroad Administration, *Highway-Rail Crossing Accident/Incident and Inventory Bulletin, Calendar Year 1994* (July 1995), which also defines a reportable injury for rail, or refer to the *National Transportation Statistics (NTS)-1999* or the *NTS-98*.

The Federal Railroad Administration defines three categories of reportable events:

- (1) Train Accident: a collision, derailment, or other event involving the operation of railroad on-track equipment resulting in damages that exceed the reporting threshold.

- (2) Train Incident: any event involving the movement of railroad on-track equipment that results in a death, a reportable injury, or a reportable illness, but in which railroad property damage does not exceed the reporting threshold.
- (3) Nontrain Incident: an event arising from railroad operations but not from the movement of on-track equipment, which does not exceed the reporting threshold, and results in a death, a reportable injury, or a reportable occupational illness.

The reporting requirements (established in law) encompass events not strictly related to transportation. For example, if a passenger falls and breaks a leg in the station while going to a train, the injury would be reported and appear in the data as a rail injury.

*Transit:* In Tables 3-1 and 3-2 the transit total includes: transit motor bus; trolley bus; light rail (streetcar-type vehicles); heavy rail (subway); commuter rail; van-pool; demand-response (mainly transportation for the disabled or elderly); and automated guideway (electric railway operated without a vehicle operator or other crew). Figures for transit rail include light rail, heavy rail and commuter rail. Commuter rail also is included in the data for railroad fatalities and injuries. The transit total does not include data for several minor submodes, notably cable cars and ferryboats; see the *National Transportation Statistics-99 (NTS-99)*, footnotes to Tables 3-27, 3-28 and 3-29 for data on these submodes. See the *NTS-99* or the *NTS-98* for the definition of a reportable transit injury.



U.S. transit fatalities and injuries are obtained from the Federal Transit Administration's (FTA) National Transit Database (NTD) Reporting System. A transit agency is required to file a NTD report at regular intervals if it is a recipient of Urbanized Area Formula Funds. Some 400 transit agencies report, and because some agencies own and operate more than one form of transit, approximately 600 transit services are covered. Such transit operators are responsible for 90 to 95 percent of passenger kilometers traveled on transit. Other transit operators are encouraged to submit NTD forms. The transit operators report on fatalities, injuries, accidents, incidents, and property damage in excess of \$1,000. Electronic reporting has recently been implemented for the NTD. A certification from the Chief Executive Officers (CEO) must accompany all NTD reports along with an independent Auditor's Statement. When an NTD report is received, a validation process is set up, which includes a preliminary review of the data for completeness. The report is further reviewed and outstanding items are noted in writing to the agency that submitted the form.

Transit safety data are collected in four major categories: (1) collisions, (2) derailments/buses going off road, (3) personal casualties and (4) fires. The major categories are further broken down into subcategories. *Collisions* comprise collisions with vehicles, objects and people (except suicides). Of the four major categories, only the first two are included in the definition of *accident* adopted in the *National Transportation Statistics*. This definition of *accident* is relevant to understanding how double counting is removed in the overall total of U.S. transportation fatalities and injuries (see *Cross-Modal Comments*, above). The transit data presented in Tables

3-1 and 3-2 are for all incidents covering all four of the major categories of events listed above. Thus, for example, fatalities and injuries arising from a fall in a transit station or tripping while getting off a bus are counted. For more detail, the reader should consult U. S. Department of Transportation, Federal Transit Administration, *Safety Management Information Statistics (SAMIS) Annual Report*.

*Water transport, recreational boats:* U.S. data for fatalities and injuries from recreational boating are based on required reports submitted to the U.S. Coast Guard. Federal regulations (U.S. Code of Federal Regulations 33 (CFR-33,173-4)) require the operator of any vessel that is numbered or used for recreational purposes to submit an accident report when, as a result of an occurrence involving the vessel or its equipment: (1) a person dies, (2) a person is injured and requires medical treatment beyond first aid, (3) damage to the vessel and other property totals more than \$500 or there is a complete loss of the vessel or (4) a person disappears from the vessel under circumstances that indicate death or injury. Although there is no quantitative estimate of the response rate, there may be considerable underreporting, especially of nonfatal accidents, because of the difficulty of enforcing the requirement and because boat operators may be apathetic to, or may not always be aware of, the law.

*Water transport, commercial vessels (passenger and freight):* Data in Table 3-1 and 3-2 include: (a) U.S. flag vessels operating *anywhere in the world* and (b) foreign flag vessels operating within the jurisdiction of the United States (within 12 miles or having an interaction with a U.S. entity, such as a platform within 200 miles or a collision with a U.S. ship.). U.S. territories and protectorates



are included. All deaths and injuries cited result from vessel casualties, such as groundings, collisions, fires or explosions. Fatalities include both people who died and those who were declared missing subsequent to a vessel casualty.

The fatality and injury numbers in Tables 3-1 and 3-2 are taken from marine casualty notifications to the Coast Guard required by the U.S. Code of Federal Regulations (46 CFR 4.05-1) for U.S. flag and foreign vessels, and the subsequent investigation reports. The 1990 data are taken from the casualty maintenance database (CASMAIN) and its personnel casualty table (PCAS). The 1995 and 1996 data are taken from the U.S. Coast Guard Marine Safety Information System (MSIS), and specifically from the Marine Investigations Module. MSIS, which captures marine safety data, is complemented by an analysis database, the Marine Safety Management System (MSMS).

In Tables 3-1 and 3-2, the categories *Commercial Passenger Vessels* and *Commercial Freight Vessels* correspond to the U.S. Coast Guard's categories of *Passenger Vessels* and *Cargo Vessels*, respectively. The Coast Guard defines passenger vessels as: "a vessel that carries passengers for hire domestically, and more than 12 passengers for hire on an international voyage. This includes uninspected passenger vessels, small passenger vessels, passenger and dinner cruise vessels, and cruise ships." The Coast Guard defines cargo vessels as: "a vessel that is engaged in commerce by carrying or facilitating the carrying of cargo. This category includes fishing vessels, but does not include mobile offshore drilling units. A cargo vessel on an international voyage may carry cargo and up to 12 passengers for hire." However, data disaggregated into *Passenger Vessels* and

*Cargo Vessels* were not readily available for this publication.

**Table 3-3**  
**Motor Vehicle Fatality and Injury Rates**

**Canada**

Table 3-3 is based on the following primary sources:

Fatalities and injuries: Transport Canada. Road Safety and Motor Vehicle Regulation. *Traffic Accident Information Database*. Special tabulation. (Ottawa, Ont.: 1998).

Vehicle-kilometers: Transport Canada. Minister of Public Works and Government Services. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

Number of Road Motor Vehicles: Statistics Canada. *Road Motor Vehicles Registrations, Catalogue 53-219-XPB*. (Ottawa, Ont.: various years).

See notes under *Road* for Tables 3-1 and 3-2 for a discussion of how road fatality and injury data are collected. See notes under Table 8-1 for how vehicle-kilometer data are collected. See notes under Table 12-1 for how data on number of road vehicles are collected. Data for 1990, 1995 and 1996 motor vehicle injury and fatality rates per 100 million vehicle-kilometers are based on Transport Canada estimates of vehicle-kilometers traveled by passenger motor vehicles and light trucks during 1995. Estimates of vehicle-kilometers are based on: (1) road motor vehicle fuel sales (net sales on which taxes were paid at road-use rates); (2) estimates of fuel efficiency by class of vehicle; and (3) estimates of average occupancy. Data for motor vehicle injury and fatality rates per 10,000 registered vehicles are based on the number of registered motor vehicles for

1990, 1995 and 1996 and include personal vehicles (personal passenger cars, motorcycles, light trucks) and commercial vehicles.

### Mexico

Road motor vehicles: Instituto Nacional de Estadística, Geografía e Informática based on figures from Departamento del Distrito Federal, Dirección General de Autotransporte Urbano; state finance office and state Police and Traffic offices. (Mexico City, D.F.: various years).

Road fatalities and injuries: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad or their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

Secretaría de Comunicaciones y Transportes. Dirección General de Policía Federal de Caminos y Puertos. (Mexico City, D.F.: various years).

### United States

Table 3-3 is based on a modification of a similar table published in the U. S. Department of Transportation, Bureau of Transportation Statistics. *National Transportation Statistics 1998 (NTS-98)*. (Washington, DC: 1998) and *National Transportation Statistics 1999 (NTS-990)* (Washington, DC: 1999). This table is based on the following primary sources:

U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 1997*. Washington, DC (November, 1998).

Fatalities: U.S. Department of Transportation.

National Highway Traffic Safety Administration (NHTSA). National Center for Statistics and Analysis. *Fatality Analysis Reporting System (FARS)*. (Washington, DC: 1998).

Injuries: U.S. Department of Transportation. National Highway Traffic Safety Administration (NHTSA). National Center for Statistics and Analysis. *General Estimates System (GES) and Fatality Analysis Reporting System (FARS) 1998*. (Washington, DC: 1998).

Vehicle-kilometers:

1990, 1995: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Table VM-201A.

1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table VM-1.

Number of road motor vehicles:

1990: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Table VM-201A.

1995 and 1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table VM-1.

See the notes under *Road* for Tables 3-1 and 3-2. As discussed there, a great deal of effort is devoted to getting a complete and accurate count of road fatalities on public roads. Consequently, the error in the fatality rate is dominated by the error in vehicle-kilometers, which currently can only be roughly estimated. (See notes under Table 12-1 for information on how data on the number of road vehicles are collected, and Table 12-2 for how the data on vehicle-kilometers

are collected.) The level of precision shown in Table 3-3 for the fatality rates is the level reported by the U.S. Department of Transportation National Highway Traffic Safety Administration in their summary document, *Traffic Safety Facts, 1997*.

Because the injury data come from a survey, they are subject to sampling error. See U.S. Department of Transportation, National Highway Traffic Safety Administration, *Traffic Safety Facts 1997*, Appendix C, Table of Standard Errors. For 3,000,000 injuries, the standard error is 5.3 percent.

**Table 3-4**  
**Air Carrier Fatality and Injury Rates**

#### **All Countries**

In order to forestall invalid conclusions based on the rates alone, standard deviations for the fatal accident rates and the fatality rates are estimated. The standard deviation for the injury rate is more difficult to estimate, and thus has been omitted. The standard deviation is a measure of predictability, assuming the system being measured does not change. If two numbers differ by three standard deviations or more, it can be said, with a very high level of confidence, that the two numbers are in fact different, and that the two systems they describe are in some way different. If two numbers differ by less than one standard deviation, all that can be concluded is that the numbers appear not to be different, and that the systems they describe have not been shown to be different.

*Type of aircraft:* In Table 3-4, and in the discussion that follows, only fatal accidents, fatalities and injuries involving large aircraft are considered. Each country defines the exact meaning of "large aircraft" in the individual country notes below.

*Calculation of standard deviations for fatal accidents (all countries):* There are several ways to estimate the standard deviation of a small number of uncorrelated events (e.g., 27 fatal accidents), using Poisson statistics. The results of the estimates differ somewhat, and the differences increase as the number decreases. In the discussion that follows, the simplest estimate is presented, for the sake of clarity. For the calculation of the standard deviations in the fatal accident rates in Table 3-4, a more sophisticated estimate has been used. However, **all the estimates lead to the same conclusion: the Canadian, U.S. and Mexican fatal accident rates differ by only about one standard deviation, or less.**

*Standard deviation, fatal accidents (United States):* The standard deviation for the number of fatal accidents is approximately plus or minus the square root of the number of fatal accidents. (As noted above, this is a simplification.) In the case of the United States, with 27 fatal accidents in 57 million flight segments, this means that if the air safety system remained unchanged for a very, very long period of time, it would be expected, to a 68 percent confidence level, that the average number of fatal accidents per 57 million flight segments would be between 22 and 32. Twenty-seven fatal accidents in 57 million flight segments gives a fatal accident rate of 0.047 fatal accidents per 100,000 flight segments. The standard deviation in the fatal accident rate is, in percentage terms, the same as the standard deviation in the number of fatal accidents. The square root of 27 is 19 percent of 27, and the standard deviation on the U.S. fatal accident rate of 0.047 is plus or minus (+/-) 19 percent of 0.047, or plus or minus (+/-) 0.009. The standard deviation given in Table 3-4 for the U.S.



fatal accident rate is plus 0.010/minus 0.008. This is a result of a better estimate.

*Standard deviation, fatal accidents (Canada):* The standard deviation on the Canadian fatal accident rate is calculated in the same way as that for the United States. The difference between the simple calculation (standard deviation of  $\pm 0.025$ ) and the better estimate shown in Table 3-4 ( $+0.031$ ,  $-0.021$ ) is sizable, because the number of fatal accidents (7) is very small.

*Standard deviation, fatal accidents (Mexico):* The standard deviation on the Mexican fatal accident rate is more complicated to estimate. With only one fatal accident, the simple square root estimate breaks down completely, and with Poisson statistics the standard deviation (technically, the one sigma confidence limit on the mean) becomes highly asymmetric, smaller on the downside and bigger on the upside. In principle, the standard deviation on one fatal accident can be calculated, but has not been done for this table. However, it can be said, with absolute confidence, that the standard deviation on the Mexican fatal accident rate (0.047) based on one fatal accident is not only bigger, but much bigger, than the standard deviation ( $+0.010$ ,  $-0.008$ ) on the U.S. fatal accident rate (0.047) based on 27 fatal accidents.

*Calculation of standard deviations for fatality rates (all countries):* If all accidents had the same number of fatalities, then the standard deviation on the fatality rate would be, in percentage terms, the same as the standard deviation on the fatal accident rate. That is (to continue with the simplified calculation), if the United States' 922 fatalities had occurred in 27 accidents with 34 fatalities each, then the standard deviation on the fatality rate would be slightly less than 20

percent. (The square root of 27 is 19.2 percent of 27.)

However, in the case of the United States, 16 of the 27 accidents had fewer than 10 fatalities each, and nearly 70 percent of the fatalities occurred in 4 accidents, each of which killed more than 100 people. In the case of Canada, 6 of the 7 fatal accidents had fewer than 10 fatalities each; the seventh claimed 261 lives. In statistical terminology, the number of fatalities is highly correlated with the number of **large** fatal accidents, and the standard deviation on the fatality rate is thus dominated by the standard deviation on the rate of **large** fatal accidents. Thus, to calculate the standard deviations on the U.S. and Canadian fatality rates correctly, it would be necessary to calculate the "large fatal accident rates" and their standard deviations for the two countries. This would mean calculating the standard deviation on one large fatal accident for Canada (and on four large fatal accidents for the United States.) This has not been done for this table. Instead, a gross underestimate has been used: that the standard deviation on the fatality rate is the same, in percentage terms, as the standard deviation on the fatal accident rate. When this is done, the U.S. and Canadian fatality rates differ by about one standard deviation. To repeat: the actual standard deviations are much larger than this crude estimate, and so **the Canadian and U.S. fatality rates differ by less than one standard deviation.**

Mexico had no large fatal air accidents during the 4-year period for which it has data, and therefore, a standard deviation for the Mexican fatality rate has not been estimated, for this table. **Without a standard deviation, no statistically meaningful comparison can be made between the Mexican fatality rate and the U.S. or Canadian**



**fatality rate.** In statistical terms, the “large fatal accident rate” for Mexico is **not** zero, but is smaller than some number to a given level of confidence, and can, in principle, be calculated from Poisson statistics. That is, even though Mexico had no large fatal accidents in 4 years and over 2 million flight segments, it cannot be stated that Mexico will never have a large fatal accident. If the U.S. data are examined, it can be seen that there have been several periods when the United States had no large fatal accidents. For example, in 1993 the United States had no large fatal accidents, and over 8 million flight segments were flown. In 1997 and 1998, the United States had no large fatal accidents, and over 20 million flight segments were flown during those 2 years. During the 1990 to 1996 period, Canada had only one large fatal accident (in 1991), and thus has gone at least 5 years and over 7 million flight segments without a large fatal accident. Even if the standard deviation (i.e., the one sigma confidence limit on the mean) for the Mexican “large fatal accident rate” were estimated, a series of assumptions would have to be made to estimate the corresponding standard deviation on the fatality rate, and this would be statistically questionable. Thus, this calculation has not been attempted.

### Canada

Table 3-4 is based on the following primary sources:

Air Carrier Fatal Accidents, Fatalities and Injuries: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Air Carrier Flight Operations: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998).

The Canadian air carrier data in Table 3-4 differ from the air carrier data in Tables 3-1 and 3-2. The air carrier data in Tables 3-1 and 3-2 present combined fatality and injury data for Canadian air carriers, commuter aircraft and air taxis/specialty aircraft. (See definitions under Tables 3-1 and 3-2.) Table 3-4 presents fatality, injury and flight segment data *only* for airliners (as defined by the Transportation Safety Board of Canada) that are operated by Canadian Level I and II air carriers. Canadian Level I and Level II operators include all air carriers that, in each of the 2 calendar years immediately preceding the report year, transported at least 50,000 revenue passengers or at least 10,000 metric tons of revenue goods. In Tables 3-1, 3-2 and 3-4, Canadian data cover only Canadian registered aircraft operated by Canadian carriers, and include both domestic and international flights, both scheduled and nonscheduled operations, and both passenger and all-cargo flights. Accidents that result in fatalities on the ground, but not on the aircraft, are not counted as fatal accidents. Fatalities and injuries on the ground are not counted. Also see the definitions of aviation accidents, fatalities and serious injuries for Tables 3-1 and 3-2.

### Mexico

Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Aeropuertos y Servicios Auxiliares. (Mexico City, D.F.: 1998).

*Number of fatal accidents, fatalities and injuries:* Data include only commercial aircraft that are operated by Mexican flag carriers, and that have 30 seats or more, or an equivalent freight capacity. Both domestic and international flights are included.

*Flight segments:* The number of flight operations was estimated as the sum of take-offs plus landings divided by two, for scheduled and nonscheduled commercial aviation, in airports under the administration of Aeropuertos y Servicios Auxiliares. Note that some nonscheduled commercial aviation operations are performed at airports not under ASA's administration. Moreover, some scheduled Mexican aviation operations are performed at airports outside Mexico. These two factors cause the estimate of the number of flight operations to be lower than they actually are, thereby increasing the rates above their true values.

### United States

Table 3-4 is based on a modification of a similar table published in the U.S. Department of Transportation Bureau of Transportation Statistics. *National Transportation Statistics 1998*. (Washington, DC: 1998) and *National Transportation Statistics 1999* (Washington, DC: 1999).

This table is based on the following primary sources:

National Transportation Safety Board. *Annual Review of Aircraft Accident Data*, annual issues and *NTSB Press Release, SB97-03*. (Washington, DC: various years).

National Transportation Safety Board (NTSB). Analysis and Data Division, RE-50. (Washington, DC: 1998).

National Transportation Safety Board. *Aviation Accident Statistics*. Web site: [www.nts.gov/aviation/Stats.htm](http://www.nts.gov/aviation/Stats.htm)

National Transportation Safety Board. *Accident Synopses*. Web site: [www.nts.gov/aviation/Accident.htm](http://www.nts.gov/aviation/Accident.htm)

See also: U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. (Washington, DC: 1997). Chapter 9. Web site: [www.faa.gov/handbook/1996/toc96.htm](http://www.faa.gov/handbook/1996/toc96.htm)

The air carrier data in this table differ from the air carrier data in Tables 3-1 and 3-2. The data in this table include only commercial aircraft that are operated by U.S. flag air carriers, and that have more than 30 seats or that have a maximum payload capacity of more than 7,500 pounds (3,402 kg). These aircraft are regulated under the U.S. Code of Federal Regulations 121 (14 CFR 121). In contrast, the air carrier data in Tables 3-1 and 3-2 include not only these larger aircraft, but smaller aircraft (commuters and on-demand air taxis) that are regulated under the U.S. Code of Federal Regulations 135 (14 CFR 135). In all three tables, the U.S. data cover only aircraft operated by U.S. flag carriers, and include both domestic and international flights, both scheduled and nonscheduled operations, and both passenger and all-cargo flights. Because the regulations for the larger aircraft differ from the regulations for the smaller aircraft, it is not instructive to combine the two categories in calculating safety rates. It should also be noted that during the research phase of this project, a change in regulations occurred. Since March 20, 1997, 14 CFR-121 began to cover some smaller aircraft (i.e., aircraft with 10 or more seats) that were formerly regulated under 14 CFR-135. This change does not affect the data in this publication, because of its 1996 cutoff.

Also see the notes under *Air* for Tables 3-1 and 3-2. As discussed there, the count of fatal accidents and fatalities is complete and

highly accurate. The exposure data (i.e., the number of flight segments) are based on a 100 percent reporting by the airlines to the U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information. Therefore, statistical fluctuation dominates the standard deviations. (Also see the section on *Calculation of Standard Deviations*, above.)

**SECTION 4: TRANSPORTATION, ENERGY AND THE ENVIRONMENT**

**Table 4-1**  
**Energy Consumption by the**  
**Transportation Sector**

**Canada**

Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue 57-003-XPB*. (Ottawa, Ont.: various editions).

Figures for total energy consumption include renewable energy. Total energy consumption also includes all electricity production, including electrical system energy losses. Data for total transportation energy consumption include fuel used in fisheries and in private trucking, but excludes fuel consumption by public administrations. The electricity component of transportation energy consumption excludes electrical system energy losses. Natural Gas data include gas plants and Natural Gas Liquids (NGLs). Natural gas volumes were converted from units of trillion of cubic feet to units of trillion cubic meters using a conversion factor of 0.02832. Petroleum data include energy from petroleum products. Petroleum data exclude energy derived from crude oil.

**Mexico**

Secretaría de Energía. *Balance Nacional, Energía*. 1996. (Mexico City, D.F.: 1998).

Data on total energy consumption include losses resulting from the transformation of one form of energy to another, self-consumption (principally at electrical power plants), and the transportation, distribution and storage of fuels and electricity. These losses add up to 1.63 exajoules (1990), 1.68 exajoules (1995) and 1.86 exajoules (1996). For each year, consumption of liquefied petroleum gases (LPG) accounts for about 1.5 percent of the total.

**United States**

Table 4-1 is based on a modification of a similar table published in the U.S. Department of Energy, Energy Information Administration's *Annual Energy Review*. This table is based on the following primary sources:

Energy consumption and transportation, total: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 2.1

Transportation consumption of natural gas, petroleum and electricity and transportation electrical system losses: U.S. Department of Energy. Energy Information Administration. *Monthly Energy Review, August 1998*. (Washington, DC: 1998). Table 2.5.

Natural gas (trillion cubic meters): U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 6.6.

Petroleum (million barrels): U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 5.12b.

Energy consumption, total: Data include electrical system losses (production, transmission and distribution). In exajoules, these are 21.5 for 1990; 23.0 for 1995 and 23.7 for



1996. (Data are from the Department of Energy's *Annual Energy Review*, Table 2.1). Total energy consumption also includes renewable energy used by electrical utilities and residential, commercial, industrial users and transportation. The Energy Information Administration (EIA) at the Department of Energy uses the higher heating values (gross heat content) of fossil fuels in arriving at total energy consumption; that is, the energy in the fuel spent vaporizing the water produced by the burning of the fuel is counted.

*Transportation consumption, total:* Data **do not** include electrical system energy losses. In exajoules, these are 0.033 for 1990; 0.028 for 1995 and 0.030 for 1996. The transportation total also includes about 0.1 exajoule each year in the form of ethanol blended into motor gasoline. This is, by far, the largest use of renewables in transportation. (See Table 4-3.) In this table, fisheries are not included in transportation.

*Conversions:* To convert from barrels of petroleum to exajoules: One barrel of petroleum has a heat content of approximately 5.74 billion (thousand million) joules (from the Department of Energy's *Annual Energy Review*, Table A3). To convert from cubic meters of natural gas to exajoules: one cubic meter of natural gas has a heat content of approximately 38.3 million joules (from the Department of Energy's *Annual Energy Review*, Table A4.)

**Table 4-2**  
**Energy Consumption by Mode of Transportation**

#### Canada

Table 4-2 is based on the following primary sources:

All modes, except transit rail: Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue 57-003-XPB*. (Ottawa, Ont.: various quarterly editions).

Natural resources Canada. *Canada's Energy Outlook 1996-2020*. (Ottawa, Ont.: 1998).

Transit rail: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue 53-215-XPB*. (Ottawa, Ont.: various years).

Air fuel data include sales to foreign carriers, but exclude fuel purchased by Canadian carriers abroad. Data for road, other fuels refer to liquid petroleum gases (LPGs). Rail fuel data are for diesel fuel only. Transit fuel data refer to all urban public transit, including local motor buses, light rail and heavy rail. Data for water transport fuel include fuel sold to fisheries operators. Water data also include sales to foreign carriers, but exclude fuel purchased by Canadian carriers abroad.

#### Mexico

Secretaría de Energía. *Balance Nacional, Energía 1996*. (Mexico City, D.F.: 1998).

Comisión Nacional para el Ahorro de Energía. Private communication. (Mexico City, D.F.: 1998).

Starting in 1991, diesel was gradually substituted for residual fuel oil for water transport. As shown by the data in the table, this substitution was almost complete by 1995.

#### United States

Table 4-2 is based on the following primary sources:

Total Transportation Energy Consumption: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 2.1.



#### Air:

Jet fuel: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication, based on Form 41 Financial Reports submitted by the large certificated air carriers to DOT under CFR 241. (Washington, DC: 1998). (See notes for the definition of "large certificated air carriers.")

U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Avionics Survey*. (Washington, DC: various years). Table 5.1.

Aviation gasoline: U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Avionics Survey*. (Washington, DC: various years). Table 5.1.

#### Road, gasoline and diesel:

1990, 1995: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Table MF-221.

1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table MF-21.

Road, other fuels: U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997). Table 10.

Pipeline: U.S. Department of Energy. *Natural Gas Annual 1996*. (Washington, DC: 1997). Table 101 and similar tables in earlier editions.

Freight rail: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997). Page 40.

#### Intercity passenger rail:

1990: National Railroad Passenger Corp. State and Local Affairs Department. Private Communication. (Washington, DC: 1998).

1995, 1996: National Railroad Passenger Corp. Director of Fuel Management. Private Communication. (Washington, DC: 1998).

Transit rail: American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

American Public Transit Association. Private Communication. (Washington, DC: 1998).

#### Water transport:

Residual and distillate/diesel fuel oil: U.S. Department of Energy. Energy Information Administration. *Fuel Oil and Kerosene Sales*. (Washington, DC: various years). Tables 2 and 4 and similar tables in earlier editions.

Gasoline: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table MF-24 and similar tables in earlier editions.

Total fuel consumption: Data differ from the sum of the rows, because the total comes from the U.S. Department of Energy, which is more inclusive than the U.S. Department of Transportation, the source of much of the individual modal data in the table. The total is larger than the sum of the modal categories in Table 3-2 by 1.44 exajoules in 1996; by 1.37 exajoules in 1995; and 1.55 exajoules in 1990.

There are two second-order corrections to these discrepancies. First, fuel consumed by local transit buses and other road transit vehicles is reported both under road and under transit. For each year, this *increases* the discrepancy by roughly 0.1 exajoules. Second, U.S. data are unavailable for the amount of electricity and diesel used to

transport the contents of pipelines. Using the Canadian pipeline data as a guide, including pipeline electricity and diesel for the U.S. would *reduce* the discrepancy by roughly 0.1 exajoules (including energy system losses) for each of the 3 years. Thus, these two second-order corrections are both small, are in the opposite direction, and can therefore be neglected.

A rigorous reconciliation between the Department of Energy and Department of Transportation data is beyond the scope of these notes. However, DOE's *Annual Energy Review*, Table 5.12b reports jet fuel consumption of 3.32 exajoules for 1990, 3.30 exajoules for 1995 and 3.46 exajoules for 1996. These are between 1.4 and 1.5 exajoules larger than the jet fuel numbers in Table 4-2, almost exactly the amount of the discrepancy. The DOE figures include jet fuel consumed by the military, by other federal agencies, by foreign carriers fueling in the U.S. and by all U.S. air carriers, not just those meeting the definition of a "large certificated carrier." (See Air, below, for a more complete definition of what is included under jet fuel in Table 4-2.)

Other items are left out of the individual modal numbers in Table 4-2. Nonclass I rail is not included, nor are electrical system losses for rail and transit. Military use of gasoline is left out of the road category in Table 4-2. (Federal civilian use of gasoline is included, as are state, county and municipal use.) Nor are losses arising from the evaporation and handling of road gasoline included in the road category in Table 4-2. All governmental use of diesel road fuel is left out of FHWA's category "Special Fuels," and thus is left out of Table 4-2. All of these together probably add up to less than 0.5 exajoules. (See *NTS-99*, Table 4-19 and the

*Annual Energy Review-1997*, Tables 1-12 and 1-13 for data on military use of energy.)

*Air, jet fuel:* Data include *only* jet fuel consumed by the large certificated carriers *in their domestic operations*, plus on-demand air taxis and general aviation. Large certificated carriers account for 95 percent to 96 percent of the jet fuel reported in Table 4-2. A *large certificated air carrier* is an air carrier "holding a certificate issued under Section 401 of the Federal Aviation Act of 1958, as amended, that: (1) operates aircraft designed to have a maximum passenger capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds [8,165 kg]; or (2) conducts operations where one or both terminals of a flight stage are outside the 50 states of the United States, the District of Columbia, the Commonwealth of Puerto Rico and the U.S. Virgin Islands." The large certificated air carriers are divided into four groups, according to operating revenue: Majors, Nationals, Large Regionals and Medium Regionals. The jet fuel data in Table 4-2 exclude the Medium Regionals, small certificated air carriers, scheduled commuters, foreign airliners fueling in the United States, the military and other governmental users.

*Road:* Gasoline includes private, commercial and governmental use, with the exception of the military. The Federal Highway Administration's category "Special Fuels" appears to exclude civilian government and military use. (See *Highway Statistics*, cited above.) More than 99 percent of FHWA's category "Special Fuels" is diesel. Data for the category "Other Fuels" in Table 4-2 are taken directly from the "Total Alternative Fuels" category of Table 4-3; the conversion factor used is that for gasoline, because the data in Table 4-3 are stated as gasoline-equivalent liters.

*Transit:* Data cover all transit, including local transit buses and other road transit vehicles, which also are reported under Road. Some ferryboats, however, are not included. (Web site: [www.apta.com/](http://www.apta.com/), click on Statistics.) For 1995 and 1996, the entry “Gasoline” includes all nondiesel fuels, except for compressed natural gas (CNG). (On a volume basis, gasoline accounted for about 70 percent of the entry “Gasoline” in 1995 and 1996.) For 1990, the entry “Gasoline” includes only gasoline.

*Conversion factors:* See NTS-99, Table 4-6 for the volume-to-energy conversion factors. The NTS conversion factors are in U.S. measurements (BTUs per gallon). Multiply the factors by 278.7 to get joules per liter.

**Table 4-3**  
**Estimated Consumption of Alternative and Replacement Fuels for Road Motor Vehicles**

**Canada**

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

**Mexico**

The principal alternative fuel in Mexico for the years reported is liquified petroleum gases (LPG). As a motor fuel, LPG is used mainly in cities by commercial light-duty trucks, as a result of private custom-fitting.

**United States**

Table 4-3 is taken from the following primary source, with only a change from gallons to liters: U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997). Table 10.

*Fuel consumption, total:* The total represents the sum of alternative fuels, gasoline and diesel. The oxygenates are included in gasoline.

*Methanol and ethanol:* The remaining portion of 85-percent methanol and both ethanol fuels is gasoline. Consumption data include the gasoline portion of the fuel.

*MTBE:* Data include a very small amount of other ethers.

*Gasoline:* Data include MBTE and ethanol in gasohol.

*Data definitions and sources:* In the United States, the definitions for alternate fuels and replacement fuels are set by Section 301 of the Energy Policy Act of 1992, and are summarized in the annual U.S. Department of Energy, Energy Information Administration publication, *Alternatives to Traditional Transportation Fuels*.

In Table 4-3, U.S. fuel quantities are expressed as gasoline-equivalent liters (gallons) to allow direct comparisons among different types of fuel. According to *Alternatives to Traditional Transportation Fuels*, the gasoline equivalent is computed by dividing the lower heating value of the alternative fuel by the lower heating value of gasoline and multiplying the quotient by the volume of alternative fuel consumed. Lower heating value is the joule content per unit of fuel, excluding the heat produced by condensation of water vapor in the fuel.

Table 4-3 is taken *directly* from *Alternatives to Traditional Transportation Fuels*, with only a simple conversion from gallons to liters. *Alternatives to Traditional Transportation Fuels* describes in some detail how consumption values for the various alternative fuels are calculated. Briefly, the consumption of alternative fuels in a given year is estimated



from the numbers of different kinds of alternative-fueled vehicles in operation in that year, the annual average vehicle-miles-traveled (vmt) for equivalent conventional vehicles, and estimates of fuel efficiency. The vmt is adjusted downward for the alternative fueled vehicles, to allow for less intensive use of alternative-fueled vehicles relative to conventional vehicles.

Oxygenate consumption is "estimated from production, net imports and stock change data from the Department of Energy's *Petroleum Supply Monthly*. *Petroleum Supply Monthly* compiles data from the Monthly Petroleum Supply Reporting System, a series of surveys that collect data from refiners, importers and transporters of crude oil and petroleum products. Oxygenate data also are collected on DOE's *Monthly Oxygenate Telephone Report*.

For Table 4-3, the Energy Information Administration at DOE took gasoline and diesel consumption from the *EIA Petroleum Supply Annual, Volume 1* (June 1997). Highway use of gasoline was estimated as 97.1 percent of total gasoline use, and highway use of diesel was estimated as 52.1 percent of total diesel consumption.

*Differences with Table 4-2:* The values for road gasoline and road diesel in Table 4-3 differ slightly from the values in Table 4-2. (See the notes under Table 4-2 for a brief description of the origin of the numbers in Table 4-2.) When the values in Table 4-2 are expressed in volume terms, road gasoline is 1.5 percent higher in Table 4-2 than in Table 4-3 for 1996 and 1.0 percent higher for 1995. The values for road diesel also differ slightly between the two tables. (Note that diesel in Table 4-3 is in gasoline-equivalent volume units, not in actual volume of diesel fuel.)

**Table 4-4**  
**Average Price of Fossil Fuel to End-Users**

(Current U.S. cents per liter)

### Canada

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

### Mexico

Petróleos Mexicanos. *Anuario Estadístico*, 1998. (Mexico City, D.F.: 1999).

Petróleos Mexicanos. PEMEX-Refinación. Subgerencia de Planeación (Mexico City, D.F.: 1999)

For further information, see: *Tasas para el Cálculo del Impuesto Especial sobre Producción y Servicios para la Enajenación de Gasolinas y Diesel* (The Federal Register, Rates to Estimate the Special Tax on Production and Services for the Sale of Gasoline and Diesel); and the *Ley del Impuesto Especial sobre Producción y Servicios* (Special Tax on Production and Services Act).

All prices are those in effect at the end of December of each year. At present there are 86 authorized fuel dealer stations in Mexico. Each month, the Secretaría de Hacienda y Crédito Público publishes in the *Diario Oficial de la Federación* (Federal Register) the rates relative to the Impuesto Especial sobre Producción y Servicio (Special Tax on Production and Services) for the sale of gasoline and diesel. The rates range from 25-30 percent on average.

After the Special Tax Rate is added to the reference price, the Value Added Tax (VAT) is added. For some gas stations, the VAT is 10 percent; for others it is 15 percent. The sum of the reference price, the Special Tax and the VAT becomes the price at the gas station.



## United States

Table 4-4 is based on the following primary sources:

Motor vehicle fuel: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998). Table 5.22.

Motor vehicle fuel taxes: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Tables FE 101A, MF 205 and MF 202.

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Tables FE 101A, MF-205, MF-121T (second page) and MF2.

### Aviation fuel:

Gasoline: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998). Table 5.20.

Jet fuel: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication, based on Form 41 Financial Reports submitted by the large certificated air carriers to DOT under CFR-241. (See notes for Table 4-2 for the definition of "large certificated air carriers.") (Washington, DC: 1998).

See also: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998). Table 5.20.

Rail fuel: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997). Page 60.

Rail fuel taxes: Association of American Railroads. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration (MARAD). Private Communication, based on reports from major U.S. flag liner operators to MARAD. (Washington, DC: 1998).

For information on U.S. federal fuel taxes, see: U.S. Internal Revenue Service, *Fuel Taxes* at [www.irs.ustreas.gov/prod/forms\\_pubs/pubs/p51005.htm](http://www.irs.ustreas.gov/prod/forms_pubs/pubs/p51005.htm)

Data sources for road gasoline and diesel and aviation gasoline: For more information on methods of data collection and a discussion of sources and sizes of errors, see U.S. Department of Energy, Energy Information Administration, *Weekly Petroleum Status Report*, Appendix A, available through Department of Energy's Energy Information Administration's web site: [www.eia.doe.gov](http://www.eia.doe.gov)

Motor vehicle fuel, gasoline and diesel: Average gasoline prices by grade are calculated by the U.S. Department of Energy, Energy Information Administration (EIA) "from a sample of service stations providing all types of service (i.e., full-, mini- and self-service) and geographic coverage for 85 urban areas." The averages are simple annual averages of monthly data from the U.S. Department of Labor, Bureau of Labor Statistics, *Consumer Prices: Energy*.

Diesel prices are derived from an EIA telephone survey of a selected sample of 350 retail on-highway diesel fuel outlets. The survey is from EIA-888, *On-Highway Diesel Fuel Price Survey*. According to the EIA, the average prices are calculated from pump prices, and therefore include all taxes, federal and state, plus state sales taxes for those states that have sales taxes on road fuel.

All 50 states, plus the District of Columbia, have a per-gallon tax on both road gasoline and road diesel, but only a few states have a

sales tax on these fuels. See *Highway Statistics 1996*, Table MF 121T for state per-gallon and sales taxes on road gasoline, diesel, LPG and gasohol, and for information on the special provisions some states apply to some road fuel users. Furthermore, some users are exempt from federal road fuel taxes; others pay a reduced rate. See *Highway Statistics 1996*, Table FE101A for exemptions and reductions to the federal road fuel tax.

*Road gasoline and diesel taxes:* Gasoline and diesel taxes for 1990, 1995 and 1996 are provided in the two tables below. In 1998, the federal fuel taxes on road gasoline and road diesel were 18.4 cents per gallon (4.9 cents per liter) and 24.4 cents per gallon (6.4 cents per liter), respectively.

			<u>Gasoline taxes</u>			
			<u>(Cents per gallon)</u>		<u>(Cents per liter)</u>	
	Federal	State*	Total	Federal	State*	Total
1990	**9.1	15.47	24.57	**2.4	4.1	6.5
1995	18.4	18.50	36.90	4.9	4.9	9.7
1996	18.3	18.67	36.97	4.8	4.9	9.8

\* State tax rates as of December 31st of each year. Weighted average based on net gallons taxed.

\*\* Applies to the first 11 months of 1990. Taxes went up by 5.0 cents per gallon (1.3 cents per liter) for both gasoline and diesel on December 1, 1990.

			<u>Diesel taxes</u>			
<u>(Cents per gallon)</u>			<u>(Cents per liter)</u>			
	Federal	State*	Total	Federal	State*	Total
1990	**15.1	16.00	31.10	**4.0	4.2	8.2
1995	24.4	18.98	43.38	6.4	5.0	11.5
1996	24.3	18.99	43.29	6.4	5.0	11.4

\* State tax rates as of December 31st of each year. Weighted average based on net gallons taxed.

\*\* Applies to the first 11 months of 1990. Taxes went up by 5.0 cents per gallon (1.3 cents per liter) for both gasoline and diesel on December 1, 1990.

*Aviation fuel, gasoline:* Data for aviation fuel gasoline represent the sales price to end-users. Prices are collected through the Energy Information Administration's 782A Survey, which "consists of a census of respondents who either directly or indirectly control a refinery or gas plant facility. As of October 1998, 155 companies respond to the EIA-782A survey. The survey results are reported in EIA's *Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report*. The data on aviation fuel in Table 4-4 do not include any taxes. The federal tax on aviation gasoline in 1998 was 5.1 cents per liter (i.e., 19.4 cents per gallon).

*Aviation fuel, jet fuel:* The data are the basic cost of fuel reported to the DOT by the large certificated air carriers for their domestic operations. These carriers are defined under *Air* in technical notes for Table 4-2. Federal taxes are not included, nor are state taxes, nor are the "into-plane fees" (which are servicing charges by the fueling company). The federal tax on aviation fuel ("other than gasoline or diesel fuel") in 1998 was 5.8 cents per liter (i.e., 21.9 cents per gallon), but, the tax was reduced to 1.2 cents per liter (i.e., 4.4 cents per gallon) to commercial airlines meeting certain specifications and the tax was not applied to domestic air carriers engaged in foreign trade or trade between the United States and any of its territories. There are also other exemptions, reductions and special provisions. For more information, see the U.S. Internal Revenue Service publication *Fuel Taxes* at [www.irs.ustreas.gov/prod/forms\\_pubs/pubs/p51005.htm](http://www.irs.ustreas.gov/prod/forms_pubs/pubs/p51005.htm)

*Rail fuel, diesel:* The numbers in Table 4-4 are the costs of diesel fuel to the Class I freight railroads, as reported by the railroads. In 1996, the Class I railroads had operating rev-

enues of \$255.0 million or more. Although Class I railroads comprise only 2 percent of the number of railroads in the U.S., they accounted for 91 percent of railroad freight revenues in 1996. The data in Table 4-4 include federal taxes as follows:

- 1990: 0.10 cents per gallon through 11/30/90 (0.03 cents per liter)  
2.60 cents per gallon remainder of 1990 (0.69 cents per liter)
- 1995: 6.90 cents per gallon through 9/30/95 (1.82 cents per liter)  
5.65 cents per gallon remainder of 1995 (1.49 cents per liter)
- 1996: 5.55 cents per gallon (1.47 cents per liter)

State fuel taxes are not included in the railroad data in Table 4-4. The railroads are not required to report state fuel taxes as such, and summary data are not available because of the great variety of state levies on rail diesel fuel.

*Water transport, combined fuels:* The data in Table 4-4 include taxes for maritime fuel, but the federal tax is applied only in restricted circumstances. In 1998, the federal tax was 6.4 cents per liter (i.e., 24.4 cents per gallon) and "is imposed on any liquid fuel used in the propulsion system of commercial transportation vessels while travelling on certain inland and intracoastal waterways. The tax generally applies to all types of vessels, including ships, barges and tugboats." The fuel tax waterways are defined in Section 206 of the Inland Waterways Revenue Act of 1978 (P.L. 95-502), as amended by the Water Resources Development Act of 1986 (P.L. 96-662). Fuel tax waterways comprise 10,867 miles of commercially significant shallow draft inland waterways. Certain types of



transportation on these fuel-tax waterways are excluded from the tax. The IRS publication *Fuel Taxes* explains when the following are exempt: fishing vessels; deep-draft (more than 12 feet) ocean-going vessels; passenger vessels; ocean-going barges; and vessels operated by state, local and Indian tribal governments. For more detail, see *Fuel Taxes*.

**Table 4-5**  
**New Model Year Fuel Efficiency for**  
**Road Motor Vehicles**

### **Canada**

Table 4-5 is based on the following primary sources:

Sales weighted averages: Transport Canada. *Transportation in Canada, 1997-Annual Report, TP 13198*. (Ottawa, Ont.: 1998).

Ranges: Natural Resources Canada. *Canada's Energy Outlook 1996-2020*. (Ottawa, Ont.: 1997). Transport Canada and Natural Resources Canada. *Fuel Consumption Guide, Annual*. (Ottawa, Ont.: various years).

### **Mexico**

Secretaría de Energía. Comisión Nacional para el Ahorro de Energía, Dirección de Transporte. (Mexico City, D.F.: 1998).

Data are estimates from the Transportation Directorate of the Comisión Nacional para el Ahorro de Energía (National Commission for Energy Conservation).

### **United States**

Table 4-5 is based on the following primary sources:

Sales weighted average new vehicle fuel efficiency (model year production):

U.S. Department of Transportation. National Highway Traffic Safety Administration

(NHTSA). Consumer Programs Division, NPS-32. (Based on the U.S. Environmental Protection Agency's Calculations of Final Fuel Economy for NHTSA). (Washington, DC: 1998).

U.S. Department of Transportation. National Highway Traffic Safety Administration (NHTSA). Automotive Fuel Economy Program. *Twenty-second Annual Report to Congress (Calendar Year 1997)*, and previous years. (Washington, DC: various years).

Ranges: U.S. Department of Transportation. National Highway Traffic Safety Administration (NHTSA). Consumer Programs Division, NPS-32. Private Communication. (Washington, DC: 1998).

New vehicle fuel efficiency: background: The U.S. Congress mandated the setting of fuel efficiency standards for new passenger cars and light trucks in the Energy Policy and Conservation Act (EPCA) of 1975 (49 USC 329). (Light trucks are defined for this purpose as 3,856 kg gross vehicle weight rating or less—i.e., 8,500 pounds or less.) These are the Corporate Average Fleet Economy (CAFE) standards. The Congress set specific numbers for the standards for 1985 and beyond (and for several earlier years) for passenger cars, but left the standards for light trucks to the discretion of the Department of Transportation (DOT). EPCA also gave DOT the authority to alter the standards for passenger cars.

To summarize, Congress assigned authority to DOT to: (1) set fuel efficiency standards for light trucks, (2) alter standards for passenger cars and (3) collect fines from manufacturers. Congress assigned this authority to DOT rather than to the Department of Energy (DOE) or the Environmental Protection Agency (EPA) because DOT already regulated the safety aspects of motor vehicles, and



Congress was concerned that the drive for high fuel economy would impact safety. Thus, Congress decided that fuel economy and safety should be regulated by the same agency. DOT then assigned fuel efficiency regulation to the National Highway Safety Administration (NHTSA) because NHTSA was the only modal administration that regulated light motor vehicles.

*New vehicle fuel efficiency numbers in Table 4-5:* The sales-weighted averages for the model year production were calculated by EPA for NHTSA, using sales figures from the manufacturers, mileage test values from the manufacturers, and the results of EPA's own mileage tests. EPA also monitors the mileage-testing programs of the manufacturers. The tests are performed on fully assembled cars, using dynamometers (i.e., not on-road tests), with a program that simulates a defined road course. The averages assume 55 percent city and 45 percent highway mileage. The averages include both domestic and imported vehicles. For more data and information, see U.S.DOT/NHTSA Automotive Fuel Economy Program, *Annual Report to Congress*.

*Ranges:* The lowest-fuel-economy and highest-fuel economy values are not the fuel economies for an entire car-line, but only for a specific engine and transmission option. Both domestic and imported vehicles are represented in the extreme values. Only gasoline-fueled vehicles are represented in the extreme values; for 1996, a light truck capable of running on compressed natural gas had a calculated *gasoline* fuel economy of 1.6 liters/100 km, but this vehicle was omitted from the ranges reported in this table.

## **Tables 4-6a and 4-6b**

### **Federal Emission Control Requirements for Passenger Cars and Light Trucks: Model Year**

### **Federal Emission Control Requirements for Heavy Trucks: Model Year**

#### **Canada**

Tables 4-6a and 4-6b are based on the following primary source: Transport Canada. Road Safety and Motor Vehicle Regulations Directorate. (Ottawa, Ont.: 1998).

#### **Mexico**

Instituto Nacional de Ecología. *Diario Oficial de la Federación. Norma Oficial Mexicana. NOM-042-ECOL-1993*. (Mexico City, D.F.: 1993).

Secretaría de Medio Ambiente, Recursos Naturales y Pesca. *Diario Oficial de la Federación. Norma Oficial Mexicana NOM-076-ECOL-1995*. (Mexico City, D.F.: 1995).

*Emission standards, background:* For passenger cars and light-duty trucks, the data in this table are from the *Mexican Official Standard NOM-042-ECOL-1993*, which sets forth the maximum allowable levels for nonburned hydrocarbons, carbon monoxide and nitrogen oxides emitted from the exhaust pipe of new motor vehicles at the assembly plant. This standard also sets the limit for evaporative hydrocarbons coming from fuel systems using gasoline, liquefied petroleum gas (LPG), natural gas and some other alternative fuels. This standard applies to vehicles with a gross vehicle weight of 400 kg to 3,857 kg. The standard was issued by the Instituto Nacional de Ecología (National Environmental Institute) in the *Diario Oficial de la Federación* (Federal Register) on October 22, 1993. The standard is available at [www.ine.gob.mx/dgra/normas/cont\\_at/vehiculos/no\\_42.htm](http://www.ine.gob.mx/dgra/normas/cont_at/vehiculos/no_42.htm).

*Heavy trucks:* For new diesel fueled heavy trucks (i.e., gross weight over 3,857 kilograms), NOM-044-ECOL-1993 sets the maximum allowable levels for the emission from the exhaust pipe of hydrocarbons, carbon monoxide, nitrogen oxides, total suspended particulates and opacity of the smoke. The standard was issued by the Instituto Nacional de Ecología (National Environmental Institute) in the *Diario Oficial de la Federación* (Federal Register) on October 22, 1993. The standard is available at [www.ine.gob.mx/dgra/normas/cont\\_at/vehiculos/no\\_44.htm](http://www.ine.gob.mx/dgra/normas/cont_at/vehiculos/no_44.htm).

For new spark-ignition heavy trucks (i.e., gross vehicle weight over 3,857 kg), NOM-076-ECOL-1995 sets the maximum allowable levels for the emission of nonburned hydrocarbons, carbon monoxide and nitrogen oxides coming from the exhaust pipe, as well as evaporative hydrocarbons coming from the fuel system. This standard applies to gasoline, LPG, natural gas and other alternative fuels. The standard was issued by the Secretaría del Medio Ambiente, Recursos Naturales y Pesca (Secretariat of Environment, Natural Resources and Fisheries) in the *Diario Oficial de la Federación* (Federal Register) on December 26, 1995. The standard is available at [www.ine.gob.mx/dgra/normas/cont\\_at/vehiculos/no\\_76.htm](http://www.ine.gob.mx/dgra/normas/cont_at/vehiculos/no_76.htm)

*Passenger cars and light-duty trucks:* Mexico does not regulate the emission of particulates for passenger cars and light duty trucks.

### United States

Table 4-6a and 4-6b are based on the following primary sources:

Passenger cars and light trucks: *U.S. Code of Federal Regulations*. (Washington, DC: 1998). 40 CFR86.094-8 and 40 CFR86.094-9.

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary*. (Washington, DC: 1992).

U.S. Environmental Protection Agency. Office of Air and Radiation. Office of Mobile Sources, Vehicle Programs and Compliance Division. *Tier 2 Study White Paper*. (Washington, DC: 1997). Web site: [www.epa.gov/orcdizux/t2paper.htm](http://www.epa.gov/orcdizux/t2paper.htm)

Heavy trucks: U.S. Environmental Protection Agency. Office of Air and Radiation. *Emission Standards Reference Guide for Heavy-Duty and Nonroad Engines* (EPA420-F-97-014) September 1997. (Washington, DC: 1997).

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary*. (Washington, DC: 1992).

Supplementary reference on mobile source emissions standards: <http://www.epa.gov/oms/stds-ld.htm> (A summary of Federal and California Light-Duty Exhaust Emission Standards)

*Emission standards, background:* Tightened emissions standards for new cars and light trucks (commonly referred to as the "Tier One Standards") began to be phased in for model-year 1994, as called for in the 1990 Clean Air Act Amendments. (Phase-ins for some standards and some categories of light trucks began later. See the *U.S. Code of Federal Regulations* or the *National Transportation Statistics (NTS)-99*. The U.S. emission standards presented in Table 4-6a are a simplified version of the Tier One emission standards. The 1996 Canadian standards, according to their note on Table 4-6a, are the U.S. standards of 1988-1993 (Tier Zero standards).

The U.S. emission standards have a long and complex history, dating back over three decades. The current and historical standards are presented in detail in the *NTS-99*. The tables in the *U.S. Code of Federal Regulations*

summarize the Tier 0 and Tier 1 standards, and cover not only gasoline and diesel-fueled cars and light trucks, but also methanol, natural gas and LPG-fueled vehicles. In addition, the Environmental Protection Agency's *Mobile Source Emissions Standards Summary* (full citation above) provides even more historical information, including detailed notes on exemptions and special provisions such as emissions averaging and high altitude standards. For emission standards for methanol, natural gas and LPG-fueled vehicles, see the *U.S. Code of Federal Regulations*. Detailed notes are not provided here on the emission standards and definitions for heavy trucks. For additional information on emissions standards of heavy trucks, see the references listed above and see web site: [www.epa.gov/omswww](http://www.epa.gov/omswww).

*Emission testing procedures:* Manufacturers test preproduction prototypes of new vehicle models in order to certify that the vehicles meet the federal emission standards. The manufacturers submit the test results to the Environmental Protection Agency, which confirms the accuracy of the figures they supply. The vehicles, which are fully assembled, are driven by a professional driver under controlled laboratory conditions, on a device similar to a treadmill. The test used to measure emissions simulates a 7.5-mile (12-kilometer), stop and go trip with an average speed of 20 miles per hour (32 kilometers per hour). The trip takes 23 minutes and has 18 stops. About 18 percent of the time is spent idling. Both cold engine starts and hot engine starts are included in the test. For more information on test protocols, go to [www.epa.gov/omswww](http://www.epa.gov/omswww).

*Implementation schedules:* For passenger cars, the Tier 1 standards were phased in at a rate of 40 percent for model-year 1994, 80 per-

cent for model year 1995 and 100 percent for model year 1996. The same schedule applies to LTD2, with the exception of particulates, which were phased in at a rate of 40 percent for 1995, 80 percent for 1996 and 100 percent for 1997. The rates apply to each motor vehicle manufacturer. For the implementation schedules for LDT1, LDT3 and LDT4, see *NTS-99* or the *U.S. Code of Federal Regulations*. (LDT refers to light duty trucks.)

*Useful life:* Useful life refers to the time or mileage over which the standards must be met. Motor vehicle manufacturers are required to produce cars and trucks that meet the standards for the specified years/miles. Consider the case of passenger cars: the vehicle must meet the first set of standards for 5 years or 50,000 miles, whichever comes first, and then the second set of standards for 10 years or 100,000 miles, whichever comes first. If there is no intermediate useful life standard (an example is the case of Nitrogen Oxide for diesel LDT2s (see below)), then the full useful life standard applies immediately. EPA checks that the vehicles are meeting the emissions standards for the intermediate and full useful lives through a program of recalls and testing. After the full useful life is met, federal emissions standards do not apply. However, as part of their inspection and maintenance procedures, the individual states may choose to require cars that have passed their full useful life (as defined by the federal emissions standards) to meet some kind of emissions standards. This would be part of a state's efforts to meet ambient air quality standards in local areas.

For the Tier 1 Standards (i.e., the U.S. standards in Table 4-6a), the useful lives are as follows:



Passenger cars and LDT1 and LDT2 light trucks:

Intermediate useful life: 5 years/ 50,000 miles

Full useful life: 10 years/100,000 miles (10 years/161,000 kilometers)

(See *NTS-99* for the useful lives for the Tier 0 standards and for the Tier 1 standards for LDT3 and LDT4 trucks. For the useful lives of heavy trucks, see U.S. Environmental Protection Agency, Office of Air and Radiation, *Emission Standards Reference Guide for Heavy-Duty and Nonroad Engines* (EPA420-F-97-014) (September 1997) or the *NTS-99*.)

*Passenger cars and light trucks, data coverage and definitions:* Table 4-6a presents only the standards for *gasoline-fueled* passenger cars and light trucks. Moreover, the table presents standards *only for one of the four classes of light trucks*, LDT2. The standards for *diesel-fueled light vehicles* differ from those in Table 4-6a as follows:

*Passenger cars, nitrogen oxides:* The standards are 0.62 g/km for intermediate useful life (i.e., the Tier 0 standard remains in force) and 0.78 g/km for full useful life.

*Light trucks, nitrogen oxides, intermediate useful life:* No nitrogen oxide standard for LDT2. (However, the full useful life nitrogen oxide standard in Table 4-6a *does* apply to diesel-fueled LDT2s.)

*Cold-temperature carbon monoxide:* Standards do not apply to diesel-fueled passenger cars or light trucks. (The *Cold-Temperature Carbon Monoxide* standard is measured at 20 degrees Fahrenheit (minus 7 degrees Centigrade) rather than 75 degrees (24 de-

grees Centigrade), and is applicable for a 5-year/50,000 mile useful life. (50,000 miles = 80,500 kilometers.)

*Categories of light trucks:* Starting in 1994, there are four categories of light trucks, LDT1 through LDT4, with LDT1 the lightest. Because of the constraints of space in Table 4-6a, only the standards for LDT2 have been presented. In 1996, LDT2s accounted for more than 60 percent of the sales of new light trucks. (See the *NTS-99* or the EPA's *Tier 2 Study White Paper*, or the *U.S. Code of Federal Regulations* for the LDT1, LDT3 and LDT4 standards.) During 1988-1993, light duty trucks were divided into two subcategories, which correspond to the current LDT1 and the LDT2// LDT3//LDT4 categories.

LDT1 and LDT2 are defined in regulations as having a Gross Vehicle Weight Rating (GVWR) of up to 6,000 pounds (2,722 kilograms). (GVWR is the value specified by the manufacturer as the maximum design loaded weight of the vehicle.) The LDT1 and LDT2 categories differ in their Loaded Vehicle Weights (LVW). (LVW is the vehicle curb weight plus 300 pounds (136 kilograms)). LDT1 has a LVW of 0 to 3,750 pounds (0 to 1,701 kilograms) and LDT2 has a LVW of 3,751 to 5,750 pounds (1,701 to 2,608 kilograms). LDT3 and LDT4 are defined in regulations as having a GVWR of 6,001 pounds to 8,500 pounds (2,722 kg to 3,856 kg). LDT3 and LDT4 are divided according to their Adjusted Loaded Vehicle Weight. For more detail, see the *EPA Tier 2 Study White Paper*. Trucks weighing 8,501 pounds (3,856 kilograms) and more are defined as Heavy Duty Trucks.



## SECTION 5: DOMESTIC FREIGHT ACTIVITY

### Tables 5-1 and 5-2

#### Domestic Freight Activity by Mode (Metric Tons)

#### Domestic Freight Activity by Mode (Metric Ton-Kilometers)

##### Canada

Tables 5-1 and 5-2 are based on the following primary sources:

**Air:** Statistics Canada. *Canadian Civil Aviation, Catalogue 51-206-XPB*. (Ottawa, Ont.: various years).

**Coastal shipping, Great Lakes and inland waterway and rail:** Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

**Pipeline:** Statistics Canada. *Oil Pipeline Transport, Catalogue 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue 57-205-XPB*. (Ottawa, Ont.: various years).

**Rail:** Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998)

**Road:** Statistics Canada. *Trucking in Canada, Catalogue 53-222-XPB*. (Ottawa, Ont.: various years).

**Air:** Air data reflect Level I to III Canadian air carriers that transported 1,000 or more metric tons of revenue goods, or 5,000 or more revenue passengers, between airports located within Canada. In Table 5-1, air data are in millions of metric tons. Actual tonnage is as follow: 1990: 386,749 metric tons; 1995: 416,171; and 1996: 447,313. In Table 5-2, data are in billions of metric ton-kilometers. Actual movements in thousands of

metric ton-kilometers are as follows: 1990: 532,396; 1995: 584,824; and 1996: 603,771.

**Pipeline:** Pipeline data include the amounts and metric ton-kilometers of oil and natural gas transported via domestic pipelines. These are calculated based upon determination of a percentage allocation between domestic and export deliveries. This split in volumes and distance is based on total volumes delivered, multiplied by the relative percentage of domestic deliveries. A conversion factor of 0.711 was used to convert cubic foot quantities of oil and natural gas moved by pipeline to metric ton equivalents.

**Rail:** Rail data are based on Class I and II rail loadings and unloadings. Class I includes Canadian National (CN) and Canadian Pacific (CPR) railways. Class II includes other railways involved in Canadian rail transportation operations. In Table 5-1 tonnage data exclude exports, imports and Class I carrier interline tonnage. In Table 5-2, the data for metric ton-kilometers similarly exclude exports, imports and Class I interline tonnage. (Freight interlined with Class II carriers was included while interline duplication between CN and CPR was removed).

**Road:** Road data are based on the *Quarterly For-Hire Trucking (Commodity Origin/Destination) Survey*. This survey measures outputs of the Canadian for-hire trucking industry by providing estimates of intercity commodity movements. Output variables include metric tons transported, commodities carried, revenues generated and origins and destinations of shipments. The target population consists of all shipments transported by Canadian domiciled for-hire motor carriers with annual transportation revenues derived from intercity trucking of \$1 million or more. Courier and messenger services are not covered by this survey.

*Water transport:* All water data are based on domestic shipping information that is collected by means of the *S.1 Domestic Shipping Report* and the *S.4 Towboat and Ferry Operators Shipping Report* (the *S.4 report* is used on the West Coast only). A record of activity is filed with Statistics Canada for each vessel entering or leaving a Canadian port in domestic shipping, with the exception of cargo vessels under 15 net registered tons, tugs or other vessels under 15 gross registered tons, Canadian naval or fishing vessels, research vessels, ballast movements for towboats and ferry operators on the West Coast.

### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1998).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1997).

*Air:* Data include shipments transported by domestic airlines under scheduled service and freight charters (shipments carried by air taxis are not included).

*Water transport:* Data include shipments made through the ports of the Pacific, the Gulf of Mexico and the Caribbean. In Table

5-2 an average distance of 630 kilometers for coastal sailing was assumed. Although this number is a 1988 estimate made by the former Dirección General de Obras Marítimas (Office of Maritime Works), the coastal sailing structure in Mexico has not changed much since then, so the figure remains a reasonable estimate.

*Rail:* Exports and imports are excluded from the rail data. Data represent the activity of all railroad systems. For Table 5-2 data were based on the average distances for the total system freight activity. For each year, the data were calculated using the following formula:

Ton-km transported in domestic traffic = (total ton-km transported/total ton transported) x ton transported in domestic traffic.

*Road:* Data are based on estimates of the number of freight vehicles registered to travel on the federal highway network in the *Sistema Integral de Información del Autotransporte Federal* (SIIAF) (Integral Information System of Federal Motor Carriers) of the Secretaría de Comunicaciones y Transportes, plus surveys that provide data on the actual average payload per vehicle per trip in tons and the number of trips per vehicle per week. Data for metric tons are calculated using the following formula:

Transported tons per year = Number of vehicles x average load per trip x average trips per vehicle per week x 52

These survey data are included in the document *Estadística Básica del Autotransporte Federal* (Basic Statistics of Federal Motor Carriers) prepared by Dirección General de Autotransporte Federal (Federal Motor Carrier General Directorate) of the Secretaría de Comunicaciones y Transportes.

For table 5-2, the estimate of metric tons is multiplied by the average distance that freight vehicles travel. The average distance is derived from a survey conducted by the Dirección General de Autotransporte Federal of the Secretaría de Comunicaciones y Transportes, and takes into consideration origin/destination information.

### United States

Table 5-1 is based on the following primary sources:

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years). Page 2.

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues). Section 1, Table 1-4.

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years). Table 1.

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts*, 1997. (Washington, DC: 1997). Page 27.

Road: Eno Transportation Foundation, Inc. *Transportation in America*, 1997. (Lansdowne, VA: 1997). Page 44.

Table 5-2 is based on the following primary sources:

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years). Page 2.

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues). Section 1, Table 1-4.

Pipeline: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years). Table 1.

Rail: Association of American Railroads. *Railroad Facts*, 1997. (Washington, DC: 1997). Page 27.

Road: Eno Transportation Foundation, Inc. *Transportation in America*, 1997. (Lansdowne, VA: 1997). Page 44.

Air: Air data are measured in enplaned revenue-tons and revenue ton-kilometers. These data include cargo, mail and express shipments. They include cargo being carried by the large certified domestic air carriers and some cargo airlines. Data for cargo carried by express carriers such as FedEx, DHL and UPS may be underrepresented. Air tonnage and ton-kilometers data represent the scheduled and nonscheduled activity of all large certified carriers. The large certificated air carriers operate aircraft with seating capacity of more than sixty seats or a maximum payload capacity of more than 8,165 kilograms (18,000 pounds.) (See technical notes under Table 4-2 for a more complete definition of the large certificated air carriers.) Data for commuter and foreign air carriers are not included. Data exclude military cargo moved by civilian carriers. Ton-kilometer data in Table 5-2 include U.S. and foreign mail and courier (express) services.



*Water transport (coastal shipping, Great Lakes, and inland waterways):* All water data are based on domestic waterborne traffic movements that are reported to the U.S. Army Corps of Engineers (USACE) by all vessel operators of record. Beginning in 1996, data on fishing are excluded for internal waterways traffic. Domestic ton-kilometers equal the cargo tonnage multiplied by the distance between the point of loading on the water and the point of unloading on the water. Specifically, for U.S.-Canada movements on the Great Lakes, ton-kilometers equal the tonnage multiplied by the distance between the U.S. and Canadian locations.

Great Lakes data include waterborne traffic between the United States ports on the Great Lakes system. The Great Lakes system is treated as a separate waterway system rather than as a part of the inland waterway system. Coastal shipping data include domestic traffic over the ocean, or the Gulf of Mexico (e.g., New Orleans to Baltimore, New York to Puerto Rico, San Francisco to Hawaii, or Alaska to Hawaii). Traffic between Great Lakes ports and seacoast ports, when having a carriage over the ocean, also is included in Coastal Shipping data. Inland waterways data represent the sum of the USACE categories of internal and intraport waterways. For USACE definitions of internal and intraport waterways, see the annual USACE publication, *Waterborne Commerce of the U.S. Part 5*.

*Pipeline:* Pipeline data in Table 5-1 are for domestic crude oil, petroleum products and natural gas shipments. Natural gas data in Table 5-1 are a BTS estimate based on Department of Energy data. Natural gas is typically measured in volumes using cubic feet, but has been converted to metric tons for purpose of this table. BTS converted the stan-

dard natural gas unit of measurement from cubic feet to metric tons, using a conversion factor of 1 metric ton to approximately 36,775 cubic feet. This conversion factor is based on assumptions about the relative composition of natural gas: proportions of methane, ethane, propane and other hydrocarbons.

Pipeline data for ton-kilometers in Table 5-2 include crude oil, petroleum products and natural gas shipments. Ton-miles for natural gas are estimates based on an approximate mile per ton rate for crude oil transported by pipelines. The crude petroleum and petroleum products data in both tables represent information from the Association of Oil Pipe Lines based on *Annual Report (Form 6)* data that oil pipeline companies submit to the Federal Energy Regulatory Commission. Note that the pipeline data for Table 5-2 will not correspond to pipeline data for ton-kilometers (ton-miles) in the annual BTS publication, *National Transportation Statistics*. This is because the NTS data for pipeline ton-miles only include crude oil and petroleum products.

*Rail:* Rail data are measured in revenue ton-kilometers and tons originated and is for Class I railroads only. In 1996 (Class I railroads had annual gross operating revenues in approximate excess of \$256 million and comprise only 2 percent of the railroads in the U.S., but account for 71 percent of the industry's distance operated, 89 percent of its employees and 91 percent of its freight revenues. Rail data reflect shipments that originated in the United States. The final destination of these shipments may or may not have been within the continental United States. The source of tonnage data in Table 5-1 are the freight commodity statistics re-



ports that Class I carriers are required by law to annually report to the Surface Transportation Board. The source of ton-kilometers in Table 5-2 are annual reports (R-1) that individual Class I carriers must also file with the Surface Transportation Board. The Association of American Railroads (AAR) then aggregates and releases a total figure for ton-kilometers by all Class I carriers on an annual basis.

*Road:* Road data represent an estimate of *intercity* trucking traffic *only*. The Eno Transportation Foundation (Eno) estimates truck tonnage based on truck tonnage trends reported by the American Trucking Association (ATA) and by truck vehicle-kilometers trends reported by the Federal Highway Administration at the U.S. Department of Transportation. Eno estimates truck ton-kilometers based on both actual changes in truck ton-kilometers as reported by the former Interstate Commerce Commission (ICC) and as based on changes in vehicle-kilometers of combination and large single-unit trucks on U.S. nonurban highways as reported annually by FHWA. To estimate truck ton-kilometers, Eno multiples vehicle-kilometers by an estimated average load figure.

**Table 5-3a**  
**Top Canadian Domestic Freight**  
**Commodities by Mode: 1996**

**Canada**

Table 5-3a is based on the following primary sources:

Pipeline, crude oil and petroleum products: Statistics Canada. *Oil Pipeline Transport, Catalogue 55-201-XPB, 1996.* (Ottawa, Ont.: 1997).

Pipeline, natural gas: Statistics Canada. *Gas Utilities, Transport and Distribution Systems,*

*Catalogue 57-205-XPB, 1996.* (Ottawa, Ont.: 1997).

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB, 1996.* (Ottawa, Ont.:1998).

Road: Statistics Canada. Transportation Division. Special "For-Hire" Trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

Pipeline data include amounts of oil, natural gas and petroleum products transported via domestic pipelines and is calculated based upon determination of a percentage allocation between domestic and export deliveries. This split in volumes is based on total volumes delivered, multiplied by the relative percentage of domestic deliveries. A conversion factor of .711 was used to convert cubic foot quantities of oil and natural gas products moved by pipeline to metric ton equivalents. Rail data in this table are based on Canadian Class I and II carriers.

**Table 5-3b**  
**Top Mexican Domestic Freight**  
**Commodities by Mode: 1996**

**Mexico**

Rail: Secretaría de Comunicaciones y Transportes based on data from the Ferrocarriles Nacionales de México. *Series Estadísticas, 1996.* (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte based on the vehicle's weight and dimensions study. (Sanfandila, Qro.: 1997).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

*Rail and water transport:* The principal transported goods are listed as individual products, not as major groupings of products. Data come from railroad bills of lading and maritime cargo manifests.

*Road:* Groups of similar products are listed. The numbers are derived from a sample using field measurements and surveys on the federal highways for the year 1993. For 24 hours during 3 consecutive days, survey and weighing stations were set up at strategic locations on the federal highway network, which covers the main routes of the country. The numbers include, but do not identify, commodities traded internationally. The data are included here because they represent the main commodities transported by road within the country.

**Table 5-3c**  
**Top U.S. Domestic Freight**  
**Commodities by Mode: 1993**

**United States**

Air, road and rail: U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).

Pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation. (Washington, DC: 1998).

Water: U.S. Army Corps of Engineers (USACE). *Waterborne Commerce of the United States, Calendar Year 1996; Part 5—National Summaries*. (New Orleans, LA: 1997).

*Air, rail, road and intermodal data:* Data for these modes are from the 1993 Commodity

Flow Survey (CFS) and are based on the Standard Transportation Commodity Classification (STCC) code. The CFS collects information on the commodities shipped by domestic U.S. manufacturing, mining, wholesale trade and selected retail and service industries. The survey excludes shipments by most service industries, governments, households and establishments classified as farms and construction. The CFS includes exports but not imports. Air data in table 5-3c represent shipments by both air and truck/air combination. Rail data represent rail single mode shipments. Road data represent shipments moved by private truck and for-hire truck. Intermodal data represent shipments moved by intermodal truck and rail combination.

*Pipeline:* Crude oil and petroleum products data are estimates from the Oak Ridge National Laboratory (ORNL), based on information from the Federal Energy Regulatory Commission. Natural gas data are BTS estimates based on information on natural gas delivered to consumers from the U.S. Department of Energy's *Natural Gas Annual*. BTS converted the standard natural gas unit of measurement from cubic feet to metric tons, using a conversion factor of 1 metric ton to approximately 36,775 cubic feet. This conversion factor is based on assumptions about the relative composition of natural gas: proportions of methane, ethane, propane and other hydrocarbons. In 1993, pipelines transported about 18.5 trillion cubic feet.

*Water transport:* Water data are from the U.S. Army Corps of Engineers' (USACE) publication, *Waterborne Commerce of United States* and are based on USACE waterborne commodity codes.

**Table 5-4a**  
**Top Canadian Domestic Freight**  
**Interprovincial Pairs by Mode: 1996**

**Canada**

Table 5-4a is based on the following primary sources:

Rail: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont: 1998). (Rail data adapted by Transport Canada from Statistics Canada Sources.)

Road: Statistics Canada. Transportation Division. Special “For-Hire” Trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada’s Marine Database.)

Rail data in this table are based on Canadian Class I and Class II carriers. Class I includes Canadian National (CN) and Canadian Pacific (CPR) railways. Class II includes other railways involved in Canadian rail transportation operations.

**Table 5-4b**  
**Top U.S. Domestic Freight Interstate**  
**Pairs by Mode: 1993**

**United States**

U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998). CD-CFS-93-2.

All modal data presented in this table are from the 1993 *Commodity Flow Survey (CFS)*, which collects information on the commodities shipped by domestic U.S. manufacturing, mining, wholesale trade and selected retail

and service industries. The survey excludes shipments by most service industries, governments, households and establishments classified as farms and construction. The CFS includes exports but not imports.

Air data represent shipments by both air and truck/air combination. Pipeline data are non-existent because the CFS data do not fully represent crude petroleum shipments by pipelines and there is no origin and destination information for pipeline shipments. Rail data represent rail single mode shipments. Road data represent shipments moved by private truck and for-hire truck. Water data include freight movements on inland, Great Lakes and deep-sea waterways. Intermodal data represent shipments moved by intermodal truck and rail combination.

**Table 5-5a**  
**Top Canadian Domestic Freight Area**  
**Pairs by Mode: 1996**

**Canada**

Table 5-5a is based on the following primary sources:

Road: Statistics Canada. Transportation Division. Special “For-Hire” Trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada’s Marine Database.)

For road and water transport data, see technical notes for Tables 5-1 and 5-2.



**Table 5-5b**  
**Top Mexican Domestic Freight Area**  
**Pairs by Mode: 1996**

**Mexico**

Air: Instituto Mexicano del Transporte based on special tabulation of the Secretaría de Comunicaciones y Transportes. (Sanfandila, Qro: 1999). Dirección General de Aeronáutica Civil.

Rail: Instituto Mexicano del Transporte. *Evaluación Económica de Mejoras a la Infraestructura del Sistema Nacional Ferroviario, Publicación Técnica No. 82*. Estimates included in this document based on information from the Ferrocarriles Nacionales de México. (Sanfandila, Qro.: 1996).

Road: Instituto Mexicano del Transporte. Special tabulation from *Estudio de pesos y dimensiones de los vehículos de carga que circulan en la red nacional de carreteras, 1994*. (Sanfandila, Qro.: 1999.)

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

Rail: The original data source document is the *Informe de Tráfico de Flete Comercial por Artículos Clasificados por Estaciones Remitentes y Receptoras (Report on Commercial Fleet Traffic per Classified Items sent to Receiving Stations)*, previously collected by the Ferrocarriles Nacionales de México. Data include all rail movements within Mexico, and may include some cargo with foreign destinations. Data shown are major interurban movements. The two highest rail freight pairs were excluded, because they owe their ranking to the transportation of raw materials for the production process of particular firms: (1) the transportation of 2,237,000 tons

of limestone between Huehuetoca and Tlalnepantla, both in the State of Mexico; and (2) 1,784,000 tons of coal between Nueva Rosita and Monclova, Coahuila.

Road: Figures come from field surveys on the federal highways for the year 1993. For 24 hours during 3 consecutive days, survey and weighing stations were set up at strategic locations on the federal highway network, which cover the main routes of the country. Figures include, but do not identify, commodities traded abroad. The data are included here because they represent the main origin/destination pairs for road transportation of goods within the country.

**SECTION 6: NORTH AMERICAN  
 MERCHANDISE TRADE**

**Table 6-1a**  
**Canadian Merchandise Trade With**  
**Mexico and the United States by Mode**  
**of Transportation**

(Current U.S. dollars)

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

*Merchandise trade, data collection and sources*: The primary objective of the Canadian International Merchandise Trade Statistical Program is to measure the change in the stock of material resources of the country resulting from the movement of merchandise into or out of Canada. When goods are imported into or exported from Canada, declarations must be filed with Canadian Customs giving such information as description and value of the goods, origin and port of clearance of commodities and the mode of transport. In 1990, Canada entered into a Memorandum of Understanding (MOU) with the United States



concerning the exchange of import data. As a consequence, each country is using the other's import data to replace its own export data. Canada's international merchandise trade statistics are, therefore, no longer derived exclusively from the administrative records of Revenue Canada, Customs and Excise, but from U.S. Customs records as well.

*Merchandise trade, definitions:* Canadian merchandise trade statistics are compiled according to the "General" system of trade defined by the United Nations Statistical Office. Under this system, imports include all goods that have crossed Canada's territorial boundary, whether for immediate consumption in Canada or stored in bonded Custom warehouses. Domestic exports include goods grown, extracted or manufactured in Canada, including goods of foreign origin that have been materially transformed in Canada, including foreign goods withdrawn for export from bonded customs warehouses. Total exports are the sum of domestic exports and reexports. Thus the general trade system, in principal, presents all goods entering through the country (imports) and all goods leaving the country (exports).

*Valuation of imports:* For Customs purposes, imports are recorded at values established according to the provisions of Canada's *Customs Act*, which, since January 1985, reflect valuation methods based on the General Agreement on Tariffs and Trade (GATT) Valuation Code System. It generally requires the value for duty of imported goods be equivalent to the transaction value or the price actually paid. To determine the transaction value of imported goods, all transportation and associated costs arising prior to and at the place of direct shipment to Canada are to be added to the price of the goods. Therefore, Canadian imports are valued f.o.b. (free

on board), place of direct shipment to Canada. This valuation excludes the freight and insurance costs in bringing the goods into Canada from the point of direct shipment.

*Valuation of exports:* To countries other than the United States, exports are, in principal, valued or recorded at the values declared on export documents, which usually reflect the transaction value; i.e., the actual selling price, or for specific transactions, the transfer price used for company accounting purposes. Canadian exports to overseas countries are valued at f.o.b. (free on board), port of exit, including domestic freight charges to the port of exit, but net of discounts and allowances. As of January 1990, Canadian exports to the United States are valued f.o.b., point of exit from Canada.

*Method of transportation:* For exports, the mode of transport information represents the mode of transport by which the international boundary is crossed. For Canadian exports via the United States to Mexico, the mode reported would be the mode used to cross the Canadian/U.S. border. If, for example, Canadian export shipments destined for Mexico travel by truck through Fort Erie, Ontario, then the mode reported in this table, and in Canadian international trade data, will be truck.

For imports, the mode of transport information represents the last mode of transport by which the cargo was transported to the port of clearance in Canada and is derived from the cargo control documents of Canadian Customs. This may not be the mode of transport by which the cargo arrived at the Canadian port of entry in the case of inland clearance. If, for example, Canadian import shipments from Mexico crossed the Canadian/U.S. border by rail, but are not cleared by Canadian Customs until they reach an-

other city by truck, the mode reported, in Canada's international trade statistics, will be truck.

In this and similar tables and for both import and export shipments, the category of *pipeline and other* are, for the most part, pipeline movements. *Other* represents mail and parcel post and other miscellaneous modes of transport.

**Table 6-1b**  
**Mexican Merchandise Trade With Canada and the United States by Mode of Transportation**

(Current U.S. dollars)

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

*Total trade:* Total export and import figures are final. Figures on exports and imports by mode of transportation are preliminary. Totals differ from the sum of the modes because data for "Postal and other" modes were not included in the modal subcategories, but were included in the overall totals.

*Maquiladora trade:* The Maquiladora industry accounted for 39.1 percent and 38.5 percent of the total value of exports for 1995 and 1996, respectively, and 35.2 percent and 33.2 percent of imports for those 2 years.

**Table 6-1c**

**U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation**

(Current U.S. dollars)

**United States**

*Total trade:* U.S. Department of Commerce. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

*Air and water:* U.S. Department of Commerce. Census Bureau. Foreign Trade Division. *FT920 Report, U.S. Merchandise Trade: Selected Highlights* (Washington, DC: December 1990, 1995 and 1996).

*Road, rail and pipeline:* U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

For a detailed documentation on U.S. international trade data, see the U.S. Census Bureau's *Guide to Foreign Trade Statistics* (available at <http://www.census.gov/foreign-trade/www/ftd.stat.guide.html>).

*Merchandise trade, data collection and sources:* Data on the value of U.S. air, maritime and land imports and exports are captured from administrative documents required by the Departments of Commerce and Treasury. In 1990, the United States entered into a Memorandum of Understanding (MOU) with Canada concerning the exchange of import data. As a consequence, each country is using the other's import data to replace its own export data. The United States' international merchandise trade statistics are, therefore, no longer derived exclusively from the administrative records of the Departments of Commerce and Treasury, but from Revenue Canada, Customs and Excise as well. Historically, merchandise trade data were obtained from import and export paper documents that

the U.S. Customs Service collected at a port of entry or exit. However, an increasing amount of import and export statistical information is now being captured electronically. Approximately 98 percent of U.S. import and 60 percent of U.S. export data are collected electronically.

*Merchandise trade, definitions:* Data represent merchandise trade activity between the United States, Puerto Rico and the U.S. Virgin Islands and Canada and Mexico. These statistics do not include traffic between Guam, Wake Island and American Samoa and Canada and Mexico.

*Valuation of imports and exports:* Import values represent the value of merchandise for duty (or Customs) purposes. It is usually the selling price in the foreign country of origin, and excludes freight costs, insurance and other charges incurred in bringing the merchandise from the foreign port of export to the United States. For *exports* to all countries except Canada, export values represent the value of the merchandise, usually the selling price, plus insurance, inland freight costs and other charges incurred in bringing the merchandise to the U. S. port of export. This is generally called the f.a.s. (free alongside ship) value. These export values *exclude* the cost of loading the merchandise aboard the exporting carrier at the port of export and also exclude freight, insurance, and any charges or transportation costs beyond the U.S. port of exportation. Because the United States does not collect information for U.S. exports to Canada from its own trade documents, the value of these exports represents the transaction value of the merchandise, plus a Statistics Canada *imputed* estimate of the costs of insurance, inland freight and other charges. Statistics Canada estimate is based on 4.5 percent of the export merchandise transaction value.

*Method of Transportation:* Method of transportation is based on the method of transportation in use when the merchandise arrived at the U.S. Customs port of entry or departed a U.S. Customs port of exit. In some instances, shipments between the United States and countries abroad enter or depart the United States through Canada or Mexico. These are called transshipments. Such transshipments are recorded under the method of transportation by which they enter or depart a U.S. Customs port regardless of the transportation mode used between Canada or Mexico and the final country of origin or destination. For U.S. exports via Canada to other overseas countries, the mode reported would be the mode used to cross the U.S./Canadian border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Buffalo/Niagara, NY, and are then shipped by water from a Canadian port to the United Kingdom, the mode reported in U.S. international trade data would be truck.

For the time period April 1993 through December 1996, transshipments were included in official U.S. trade data for land modes of transportation, and it is impossible to exclude these transshipments *at an individual modal level*. Because the land modes include transshipment data, the sum of the modal categories exceeds total U.S. trade with Canada and Mexico for 1995 and 1996. Moreover, it is not possible to calculate modal percentage shares for 1995 and 1996. Beginning in January 1997, transshipments are no longer included in the U.S. trade figures for land modes of transportation. Thus, the modal shares for 1997 can be calculated. The 1997 modal shares for total U.S. merchandise trade with Canada and Mexico are: air (5.8 percent); water (4.6 percent); road (68.0 percent); rail (14.7 percent); pipeline (3 percent); and other (3.9 percent).



## U.S. Trade With Canada and Mexico by Land Modes of Transportation\*

(Millions of current U.S. dollars)

	1995, total with transshipments	1995, total without transshipments	1996, total with transshipments	1996, total without transshipments
<b>U.S. trade with Canada</b>				
Exports to Canada	129,884.1	108,311.1	139,109.7	117,341.8
Imports from Canada	143,669.5	135,212.2	156,206.6	146,374.3
<b>U.S. trade with Mexico</b>				
Exports to Mexico	42,662.2	42,294.5	51,753.4	51,252.7
Imports from Mexico	54,048.9	51,489.7	63,312.2	62,188.1

\*Land modes of transportation include truck, rail, pipeline, government mail, flyaway aircraft (aircraft moving from the aircraft manufacturer to a customer and not carrying any freight), powerhouse electricity, pedestrians carrying freight, foreign trade zones (for imports only) miscellaneous and unknown.

**Source:** U.S. Department of Transportation, Bureau of Transportation Statistics. *Transborder Surface Freight Data* ([www.bts.gov/transborder](http://www.bts.gov/transborder))

In contrast to transshipments, *intransit shipments* are goods declared by the shipper as moving through the United States from one foreign country to another and are *not* included in the official U.S. international merchandise trade statistics, and therefore are not included in this data for this table. In a North American context, intransit shipments would include, for example, a Canadian export to Mexico, which moves by truck through the United States. This type of activity, again, is not considered to be part of U.S. international trade, and is not reflected in official U.S. merchandise trade statistics, or in the data in this table.

The following modes are included in U.S. merchandise trade statistics: air, maritime vessel, truck, rail, pipeline, government mail, flyaway aircraft (aircraft moving from the aircraft manufacturer to a customer and not carrying any freight), powerhouse electricity, pedestrians carrying freight, foreign trade zones (for imports only) miscellaneous and unknown. Data for land modes (i.e., truck, rail, pipeline, mail and other) of transportation are nonexistent prior to April 1993. Government mail, flyaway aircraft, powerhouse electricity, pedestrians carrying freight, foreign trade zones, miscellaneous and unknown methods of transportation have not



been included as specific categories for U.S. merchandise trade in Sections 6 and 7 of this publication. However, these modes of transportation are included in the overall U.S. merchandise trade figures.

**Table 6-2a**  
**Canadian Merchandise Trade With Mexico and the United States by Mode of Transportation**

(Metric tons)

### Canada

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

*Merchandise trade, weight data:* The International Trade Division (ITD) of Statistics Canada publishes monthly trade statistics for both exports and imports. The data are drawn from Revenue Canada (Customs) administrative files that are used for applying import/export and tariff regulations. A variety of trade characteristics are reported monthly for each commodity, with the main ones being country, commodity, mode of transport and value. The capture and reporting of weight information by commodity is generally given less priority than value and country data. Weight and quantity information currently reported by ITD depend, for the most part, on what commodity is being reported. For instance, most bulk commodities e.g., wheat, coal, potash, are reported in metric tons. Commodities of a more finished nature tend to be reported in various units of quantity or weight, generally using one of the international units of measure published in the Statistics Canada report, *Imports by Commodity* (65-007-XPB).

*Merchandise trade, weight data collection:* With the current system used by Revenue Canada

Customs to report international trade data; i.e., using the *B3* reporting form (for imports) and the *B13* reporting form (for exports to overseas countries), there is no requirement for custom brokers to report in one consistent unit of weight measurement. Except for exports to the United States, Canadian exporters and importers are not required to report a shipping weight for each commodity shipped. The requirement is to report an overall gross and net weight for each record, which may include one or multiple commodities on any one form. Value and mode of transport are always captured for each commodity and quantity is frequently captured. Trade data by mode of transport are published in value terms only.

*Weight conversion methodology and factors:* Canada and the United States capture and exchange import trade data as part of a bilateral data exchange agreement. On a monthly basis, Canada sends to the United States data on its imports from the United States and, in turn, receives from the United States data covering imports from Canada. As both countries record imports using different trade documents, with different requirements, the data elements collected are not consistent in all areas. For instance, the United States collects weight data for each import commodity by all modes of transportation for merchandise trade with all countries. If relevant to the commodity type, the United States also collects quantity information on all merchandise imports. However, the weight and quantity information captured by Revenue Canada depends on the type of commodity.

A variety of validation and edit checks are performed on the U.S. imports from Canada, before the data are sent back to Canada as part of the U.S.-Canada data exchange. From

this edited file, relationships can be derived between quantities, value and shipping weight for each commodity. Statistics Canada has used these relationships in the development of a weight conversion methodology and factors. Use of the Harmonized System (HS) for commodity classification has been an important component in the development of these conversions. At the six-digit HS level, exports and imports are essentially the same, and likely possess similar weight characteristics. Statistics Canada conversion methodology involves the development of factors for converting the value or quantity of international trade commodities to metric tons for six-digit HS codes. Trade commodities reported in nonmetric units for imports from all countries (including the U.S.) as well as exports to all countries (excluding the U.S.) are converted using one of the following conversion factors: quantity to shipping weight (quantity conversion factor); or value to shipping weight (value conversion factor). If quantity information is available, the quantity conversion factor is used. If not, the value conversion factor is used. Because exports to the United States already provided shipping weight information and served as the source of Statistics Canada's conversion factors, they are accepted as is.

*Method of transportation:* For exports, the mode of transport information represents the mode of transport by which the international boundary is crossed. For Canadian exports via the United States to Mexico, the mode reported would be the mode used to cross the Canadian/U.S. border. If, for example, Canadian export shipments destined for Mexico travel by truck through Fort Erie, Ontario, then the mode reported in this table, and in Canadian international trade data, will be truck.

For imports, the mode of transport information represents the last mode of transport by which the cargo was transported to the port of clearance in Canada and is derived from the cargo control documents of Canadian Customs. This may not be the mode of transport by which the cargo arrived at the Canadian port of entry in the case of inland clearance. If, for example, Canadian import shipments from Mexico crossed the Canadian/U.S. border by rail, but are not cleared by Canadian Customs until they reach another city by truck, the mode reported, in Canada's international trade statistics, will be truck.

In this and similar tables and for both import and export shipments, the category of *pipeline and other* are, for the most part, pipeline movements. *Other* represents mail and parcel post and other miscellaneous modes of transport.

**Table 6-2b**

**Mexican Merchandise Trade With Canada and the United States by Mode of Transportation**

(Metric tons)

**Mexico**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. Special tabulation. (Mexico City, D.F.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

Road and rail, 1996: Instituto Mexicano del Transporte. Special tabulations based on data from the Secretaría de Comercio y

Fomento Industrial and U.S. Bureau of Transportation Statistics. (Querétaro, Qro.: 1998). See also Juan Manuel Trejo. *Una metodología para valorar los beneficios económicos de mejoras en los sistemas de transporte* (A Methodology to Evaluate the Economic Benefits of Improving the Transportation Systems), M.S. Thesis, Querétaro Autonomous University, Qro.

*Road and rail, 1996:* The Instituto Mexicano del Transporte (IMT) estimated the figures based on data provided by the Secretaría de Comercio y Fomento Industrial in Mexico and the Bureau of Transportation Statistics in the United States. For 1995, the IMT estimates that 4,023 million tons were exported from Mexico to the north, and 11,005 million tons were imported into Mexico from the north. The United States was the origin and destination of the vast majority of these shipments, although some shipments originated in, or were destined for, Canada. There is no way of quantifying the specific proportion allocated to Canada versus the United States.

For 1996, 5,482 million tons were exported from Mexico to the north by rail. Of this, 4,813 million tons were shipped to the United States. The remaining 669 million tons were either shipped to Canada or (although originating in Mexico as rail shipments) were ultimately transshipped via air or sea through U.S. or Canadian ports. Also in 1996, 12,933 million tons were imported into Mexico from the north by rail. Of this, 10,307 million tons came from the United States. The remaining 2,626 million tons came either from Canada or from a third country, but reached Mexico as a transshipment from Canadian or U.S. ports.

**Table 6-2c**

**U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation**

(Metric tons)

**United States**

Total trade: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

Air and water: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *FT920 U.S. Merchandise Trade*. (Washington, DC: December 1990, 1995 and 1996).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

*Shipping weight:* Shipping weight represents the gross weight in kilograms of shipments, including the weight of commodities and packaging (such as wrappings, crates, boxes and containers). For air, maritime vessel and imports by land modes of transportation, shipping weight information is a required data element on the merchandise trade documents of the Departments of Commerce and Treasury. Currently, data on the shipping weight of exports by land modes of transportation (truck, rail, pipeline, mail and other) are not required to be collected if the exporter or broker files a paper trade documentation, known as the *Shipper's Export Declaration*. (At present, approximately 30-40 percent of U.S. export data are collected via paper trade documents). Under new automated filing procedures through the Automated Export System (AES), shipping weight for exports will be required. In addition, because shipping weight for imports from Mexico by land modes of transportation only



became available in April 1995, calendar year 1995 data are not available for inclusion in Table 6-2c. For additional explanation, see notes for Table 6-1c.

*Method of transportation:* Method of transportation is based on the method of transportation in use when the merchandise arrived at the U.S. Customs port of entry or departed a U.S. Customs port of exit. In some instances, shipments between the United States and countries abroad enter or depart the United States through Canada or Mexico. These are called transshipments. Such transshipments are recorded under the method of transportation by which they enter or depart a U.S. Customs port regardless of the transportation mode used between Canada or Mexico and the final country of origin or destination. For U.S. exports via Canada to other overseas countries, the mode reported would be the mode used to cross the U.S./Canadian border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Buffalo/Niagara, NY, and are then shipped by water from a Canadian port to the United Kingdom, the mode reported in U.S. international trade data would be truck.

For the time period April 1993 through December 1996, transshipments were included in official U.S. trade data for land modes of transportation, and it is impossible to exclude these transshipments, measured in weight, at either a total land trade or individual modal level. Because of this inclusion of transshipment data for the land modes of transportation, a summation of the individual modal categories will exceed the U.S. total trade with Canada and Mexico for 1995 and 1996. Beginning in January 1997, transshipments are no longer included in the U.S. trade figures for land modes of transportation.

In contrast to transshipments, *intransit shipments* are goods declared by the shipper as moving through the United States from one foreign country to another and are *not* included in the official United States international merchandise trade statistics, and therefore are not included in this data for this table. In a North American context, intransit shipments would include, for example, a Canadian export to Mexico, which moves by truck through the United States. This type of activity, again, is not considered to be part of U.S. international trade, and is not reflected in official U.S. merchandise trade statistics, or in the data in this table.

**Table 6-3a**  
**Top Canadian Gateways for North American Merchandise Trade by Mode: 1996**

(Current U.S. dollars)

#### **Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998). See notes for Table 6-1a.

**Table 6-3b**  
**Top Mexican Gateways for North American Merchandise Trade by Mode: 1996**

(Current U.S. dollars)

#### **Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).



This table shows the information by mode registered at the principal custom ports (or custom “houses”) in Mexico. Land transportation includes shipments by both road and rail. In addition, data from inland customs ports (and those not considered “principal”) are added to the overall figures for the principal customs ports shown in Table 6-3b.

**Table 6-3c**  
**Top U.S. Gateways for North American Merchandise Trade by Mode: 1996**  
(Current U.S. dollars)

**United States**

Air: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. Transportation Branch. Special tabulation. (Washington, DC: 1998).

Water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

For additional explanation, see notes for Table 6-1c.

Air data for specific airports may include a low (generally less than 2-3 percent of the total value) level of small user-fee airports located in the same regional area. In addition, data for nearby individual courier operations are included in the certain airport totals to prevent disclosure. Land port totals include transshipment data. Port totals reflect the mode of transportation in use at the time the shipment entered or exited a U.S. Customs port.

**Table 6-4a**  
**Top Mexican Maritime Intransit Shipment Ports: January-June 1997**

**Mexico**

Instituto Mexicano del Transporte. Special tabulation based on 1997 data from the Journal of Commerce. *Port Import Export Reporting Service (PIERS)*. (Querétaro, Qro.: 1998).

**Table 6-4b**  
**Top U.S. Maritime Intransit Shipment Ports: 1996**

**United States**

U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

Intransit shipments are goods declared by the shipper as moving through the United States from one foreign country to another and are *not* included in the official U.S. international merchandise trade statistics or in the United States balance of trade of goods and services. Although U.S. international merchandise trade statistics cover all methods of transportation, the intransit statistics cover only goods, which enter or leave the United States by maritime vessel. Goods may arrive by vessel and depart by air, land or vessel, or arrive by land or air and depart by maritime vessel. Therefore, inbound and outbound intransit statistics may not cover the same intransit movements and these movements of goods do not present a full picture of the intransit trade. (For example, an intransit shipment that entered the United States by truck and exited by rail would not be included in these statistics at all.) In addition, the value data for intransit statistics

are estimated based on the type of commodity and its' shipping weight. Intransit data tend to be dutiable commodities since the United States Customs Service requires that shipments transiting through the United States be handled under a Customs bond (in-bond).

**Table 6-5a**

**Top Land Freight Crossing Ports,  
Canadian-U.S. Border: 1996**

**North and southbound:**

Data for trucks represent the number of truck crossings, not the number of unique vehicles. (For example, one truck may cross back and forth across the border several times in a day.)

Northbound (Canadian data source): Statistics Canada. Culture, Tourism and the Center for Education Statistics Division. Special tabulations. (Ottawa, Ont.: 1998).

Table 6-5a is based on data collected through Statistics Canada's Frontier Count program. All ports of entry across Canada participate in determining the number of cars, trucks, motorcycles and bicycles in the case of highway and ferry points as well as the number of travelers by selected categories and by type of transportation. These surveys are conducted on a census basis except for seven ports of entry that are using sampling schemes to estimate automobiles and motorcycle flows. The sample is intended to estimate U.S. and Canadian vehicles and travelers by country of residence. The samples are selected among the seven ports in order to represent all days of the month over the region. Customs officials at these ports provide the count of automobiles and cycle traffic by country of residence for those sample days. These counts are then weighted to the total flows provided by toll authorities.

Southbound (U.S. data source): U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

Data reflect all trucks and trains that entered the United States, across the U.S.-Canadian border, regardless of carrier nationality.

**Table 6-5b**

**Top Land Freight Crossing Ports,  
Mexican-U.S. Border: 1996**

**North and southbound:**

Data for trucks represent the number of truck crossings, not the number of unique vehicles. (For example, one truck may cross back and forth across the border several times in a day.)

Northbound (U.S. Data Source): U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

Data reflect all trucks and rail cars that entered the United States, across the U.S.-Mexican border, regardless of carrier nationality.

Southbound:

Trucks: Data compiled by Texas A&M International University, Texas Center for Border Economic and Enterprise Development based on original data from bridge operators. Web site: [www.tamui.edu/coba/txcntr/](http://www.tamui.edu/coba/txcntr/)

Rail: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte 1996*. (Querétaro, Qro.: 1998).

**Table 6-6a**  
**Top Canadian Merchandise Trade**  
**Commodities by Mode With Mexico:**  
**1996**

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a.

**Table 6-6b**  
**Top Canadian Merchandise Trade**  
**Commodities by Mode With the United**  
**States: 1996**

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a.

**Table 6-7a**  
**Top Mexican Merchandise Trade**  
**Commodities by Mode With Canada:**  
**1996**

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**Table 6-7b**  
**Top Mexican Merchandise Trade**  
**Commodities by Mode With the United**  
**States: 1996**

**Mexico**

Instituto Nacional de Estadística, Geografía e

Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**Table 6-8a**  
**Top U.S. Merchandise Trade**  
**Commodities by Mode With Canada:**  
**1996**

**United States**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1996*. (Washington, DC: 1998).

Road and rail: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

See notes for Table 6-1c.

**Table 6-8b**  
**Top U.S. Merchandise Trade**  
**Commodities by Mode With Mexico:**  
**1996**

**United States**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1996*. (Washington, DC: 1998).



Road and rail: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

See notes for Table 6-1c.

## **SECTION 7: INTERNATIONAL MERCHANDISE TRADE BETWEEN NORTH AMERICA AND THE REST OF THE WORLD**

In all the tables in this section, intra-North American trade is excluded (e.g., Canada's trade with Mexico and the United States is excluded; Mexico's trade with Canada and the United States is excluded; and the United State's trade with Mexico and Canada is excluded). For the series of weight based commodity tables (7-5), data were not available for Mexico that excluded trade with Canada and the United States. A table for Mexico has been included in the technical notes section for the table series 7-5, which provides data for Mexico's top international trade commodities by weight for *all* of its international trade. This table is included between the Canadian and U.S. technical notes for Tables 7-5a and 7-5b.

### **Table 7-1 International Merchandise Trade Between North America and the Rest of the World by Value**

#### **Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a and 7-1.

#### **Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

Data refer to exports to and imports from outside North America: i.e., Canada and the United States are excluded. Figures are preliminary and approximate, and stem from a study made by Instituto Nacional de Estadística, Geografía e Informática, based on foreign trade data tapes provided by the Secretaría de Hacienda y Crédito Público. Other modes of transportation include mail and miscellaneous modes.

#### **United States**

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

See also notes for Tables 6-1c.

*Method of transportation:* Method of transportation is based on the method of transportation in use when the merchandise arrived at the U.S. Customs port of entry or departed a U.S. Customs port of exit. Data in Table 7-1 exclude U.S. trade with Canada and Mexico. For Table 7-1, data are only available for air and water modes of transportation, and the total trade represents a sum of these two modes.



In some instances, shipments between the United States and countries abroad enter or depart the United States through Canada or Mexico. These are called transshipments. Such transshipments are recorded under the method of transportation by which they enter or depart a U.S. Customs port regardless of the transportation mode used between Canada or Mexico and the final country of origin or destination. For U.S. exports via Canada to other overseas countries, the mode reported would be the mode used to cross the U.S./Canadian border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Buffalo/Niagara, NY, and are then shipped by water from a Canadian port to the United Kingdom, the mode reported in U.S. international trade data would be truck.

For the time period April 1993 through December 1996, transshipments were included in official U.S. trade data with Canada and Mexico for land modes of transportation, and it is impossible to exclude these transshipments at an individual modal level. Therefore, data are nonexistent for land modes of transportation (road, rail, pipeline and other) for Table 7-1. Beginning in January 1997, transshipment totals by truck and rail, became available for the value of U.S. transshipments through Canada and Mexico. Data for these are included in the monthly detailed data files of the Bureau of Transportation Statistics' *Transborder Surface Freight Data* ([www.bts.gov/transborder](http://www.bts.gov/transborder))

**Table 7-2**  
**International Merchandise Trade**  
**Between North America and the Rest**  
**of the World by Weight**

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See also notes for Tables 6-1a and 6-2a.

*Method of transportation, imports:* For imports, the mode of transport information represents the last mode of transport by which the cargo was transported to the port of clearance in Canada and is derived from the cargo control documents of Canadian Customs. This may not be the mode of transport by which the cargo arrived at the Canadian port of entry, if the cargo are cleared by Canadian Customs at an inland port. If, for example, commodities imported from the United Kingdom arrived by ship in Toronto, Ont., but are not cleared in Canada until they reach another city by truck, the mode reported in Canadian international trade statistics will be truck.

*Method of transportation, exports:* Exports by land modes of transportation in this table represent Canadian trade with a second country that were transshipped via a third country, generally the United States. For exports, the mode of transport information represents the mode of transport by which the international boundary is crossed. For Canadian exports via the United States to other overseas countries, the mode reported would be the mode used to cross the Canadian/U.S. border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Fort Erie, Ontario, and are then shipped by water from a U.S. port to the United Kingdom, the mode reported in Canadian international trade data in this table will be truck.

## Mexico

The following table provides data for Mexico's overall international trade by mode, measured in millions of metric tons. Data in this table *include* trade with Canada and the United States.

### Mexico's International Merchandise Trade by Weight

(Millions of metric tons)

	Mexico		
	1990	1995	1996
<b>Total trade</b>	U	U	U
Exports	U	U	U
Imports	U	U	U
<b>Air trade, total</b>	0.1	0.2	U
Exports	U	U	U
Imports	U	U	U
<b>Water trade, total</b>	107.9	123.0	145.1
Exports	88.9	103.3	117.6
Imports	19.0	19.7	27.5
<b>Road trade, total</b>	17.7	33.5	U
Exports	7.7	14.4	U
Imports	10.0	19.1	U
<b>Rail trade, total</b>	16.2	21.7	28.6
Exports	4.4	7.0	9.1
Imports	11.8	14.7	19.5

U = Data are unavailable.

**Air:** Cargo carried by domestic and foreign companies under scheduled international service. Freight charters are excluded.

**Water:** Data comprise cargo shipments through the ports of the Pacific, the Gulf of Mexico and the Caribbean.

**Road:** Data refer to international shipments that were shipped via the Mexican federal highway system. Data for 1995 were unavailable. Data in the table represent 1994.

**Rail:** Cargo imported and exported without making any distinction whether bound to the United States or Canada.

### Sources

**Air:** Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1989-1995*. (Mexico City, D.F.: 1996).

**Water:** Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

**Road:** Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1997*. (Querétaro, Qro.: 1998).

**Rail:** Ferrocarriles Nacionales de México. *Series estadísticas 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

## United States

**Air and water:** U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

See also notes for Tables 6-1c and 6-2c.

**Method of transportation:** Method of transportation is based on the method of transportation in use when the merchandise arrived at the U.S. Customs port of entry or departed a U.S. Customs port of exit. Data in Table 7-2 exclude U.S. trade with Canada and Mexico. For Table 7-2, data are only available for air and water modes of transportation, and the total trade represents a sum of these two modes.

In some instances, shipments between the United States and countries abroad enter or depart the United States through Canada or Mexico. These are called transshipments. Such transshipments are recorded under the method of transportation by which they enter or depart a U.S. Customs port regardless of the transportation mode used between Canada or Mexico and the final country of origin or destination. For U.S. exports via Canada to other overseas countries, the mode reported would be the mode used to cross the U.S./Canadian border. If, for example, export shipments that are destined for the United Kingdom travel by truck through Buffalo/Niagara, NY, and are then shipped by water from a Canadian port to the United Kingdom, the mode reported in U.S. international trade data would be truck.

For the time period April 1993 through December 1996, transshipments were included in official U.S. trade data with Canada and Mexico for land modes of transportation, and it is impossible to exclude these transshipments at an individual modal level. Therefore, data are nonexistent for land modes of transportation (road, rail, pipeline and other) for Table 7-2.

### Table 7-3a

#### **Top Canadian International Merchandise Trade Gateways by Mode: 1996 (Excluding Trade With Mexico and the United States)**

(Current U.S. dollars)

#### **Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a and 7-1.

### Table 7-3b

#### **Top U.S. International Merchandise Trade Gateways by Mode: 1996 (Excluding Trade With Canada and Mexico)**

(Current U.S. dollars)

#### **United States**

**Air:** U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. Transportation Branch. Special tabulation. (Washington, DC: 1998).

**Water:** U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

For additional explanation, see notes for Table 6-1c and 7-1.



Air data for specific airports may include a low (generally less than 2-3 percent of the total value) level of small user-fee airports located in the same regional area. In addition, data for nearby individual courier operations are included in the certain airport totals to prevent disclosure. Port totals reflect the mode of transportation (air or water) in use at the time the shipment entered or exited a U.S. Customs port.

**Table 7-4a**  
**Top Canadian International Trade**  
**Commodities by Value: 1996 (Excluding**  
**Trade With Mexico and the United**  
**States)**

(Current U.S. dollars)

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 6-1a and 7-1.

**Table 7-4b**  
**Top Mexican International Trade**  
**Commodities by Value: 1996**  
**(Excluding Trade With the United**  
**States and Canada)**

(Current U.S. dollars)

**Mexico**

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Estadística. Dirección de Estadísticas Económicas. Based on data developed through an interagency working group including the Secretaría de Hacienda y Crédito Público, Banco de México and Instituto Nacional de Estadística, Geografía e Informática. (Mexico City, D.F.: 1999).

**Table 7-4c**

**Top U.S. International Trade**  
**Commodities by Value: 1996 (Excluding**  
**Trade With Canada and Mexico)**

(Current U.S. dollars)

**United States**

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based upon U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996.* (Washington, DC: 1998).

See notes for Table 6-1c and 7-1.

**Table 7-5a**

**Top Canadian International Trade**  
**Commodities by Weight: 1996**  
**(Excluding Trade With Mexico and the**  
**United States)**

**Canada**

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Tables 6-1a, 6-2a and 7-2.

**Top Mexican International Trade**  
**Commodities by Weight: 1996**

**Mexico**

International trade data excluding trade with Canada and the United States are not available with commodity detail. The table below shows *all* international merchandise trade for Mexico by weight. The headings of each column indicate the year. (Data are *not* based on the two-digit Harmonized Schedule (HS) but on the common name of the product.)



## Top Mexican International Trade Commodities by Weight, Various Years

(Thousands of metric tons)

OVERALL	1993
<b>Exports</b>	<b>108,079</b>
Crude oil	69,117
Regular salt	6,200
Fuel oil	3,117
Gypsum	2,869
Bar or ingot iron	1,379
<b>Imports</b>	<b>50,144</b>
Fuel oil	4,364
Sorghum	3,745
Soybean seed	2,171
Wheat	1,741
Cellulose pulp for paper manufacturing	1,510
AIR	
<b>Air exports</b>	
U	U
<b>Air imports</b>	
U	U
LAND (rail only)	1995
<b>Land exports (rail only)</b>	<b>5,482</b>
Assembled motor vehicles	1,348
Cement	1,078
Beer	548
Disassembled motor vehicles	130
Iron and steel sheets and plates	389
<b>Land imports (rail only)</b>	<b>12,933</b>
Soybeans	1,406
Maize	1,257
Paper and cardboard waste	917
Wheat	601
Sorghum	582
WATER	1996
<b>Water exports</b>	<b>117,598</b>
Oil and by-products	82,662
Regular salt	7,270
Limestone	5,978
Gypsum	3,587
Cement	1,874
<b>Water imports</b>	<b>27,533</b>
Oil and by-products	4,857
Limenite	3,797
Sorghum	1,311
Wheat	1,104
Phosphoric rock and fertilizer	967

## Sources

Overall: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte*, 1996. (Sanfandila, Qro.: 1998). Based on the *Sumario Estadístico de la Revista Comercio Exterior*, April 1993 and March 1994, Banco Nacional de Comercio Exterior.

Land (rail only): Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte*, 1996. (Sanfandila, Qro.: 1998). Based on information from Ferrocarriles Nacionales de México.

Water: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte*, 1996. (Sanfandila, Qro.: 1998). Based on information from the Secretaría de Comunicaciones y Transportes, Dirección General de Puertos y Marina Mercante; i.e., based on information from the Secretaría de Comunicaciones y Transportes, Dirección General.

## Table 7-5b

### Top U.S. International Trade Commodities by Weight: 1996 (Excluding Trade With Canada and Mexico)

#### United States

Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based upon U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

See notes for Table 6-1c, 6-2c and 7-2.

## SECTION 8: DOMESTIC PASSENGER TRAVEL

Data do not include passenger travel by commercial freight vehicles.

**Table 8-1**  
**Domestic Passenger Travel by Mode**

### Canada

Table 8-1 is based on the following primary sources:

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue 51-206-XPB*. (Ottawa, Ont.: various years).

Road: Transport Canada. Minister of Public Works and Government Services. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB*. (Ottawa, Ont.: various years).

*Passenger-kilometers, total*: The total is approximate because it is dominated by an estimated number for road, and because data for general aviation do not exist. (Transit also is estimated, and placed under Local Motor Bus, under Road.)

Air: Air data reflect Canadian Level I through Level III air carriers that, in each of the 2 calendar years immediately preceding the report year, transported 5,000 or more revenue passengers, or 1,000 or more metric tons of revenue goods, between airports located within Canada. Data for general aviation/noncommercial passenger travel do not exist because this type of information is not collected. As a result, a total for domestic passengers transported by the air mode of transport in Canada is also nonexistent.

Road: Road passenger-kilometer data are based on a Transport Canada estimate for 1995 of the number of vehicle-kilometers traveled by personal motor vehicles (includes passenger cars, motorcycles and light trucks) and buses. Estimates of vehicle-kilometers are calculated based on: (1) road motor vehicle fuel sales (net sales on which taxes were paid at road-use rates); and (2) estimates of fuel efficiency by class of vehicle. Estimates of average occupancy are then applied to the estimates of vehicle-kilometers to arrive at passenger kilometers. Buses include inter-city, charter, school and local transit buses.

Rail: Rail data include Class I (VIA Rail) and Class II (other carriers involved in Canadian rail passenger transportation operations) Canadian railways.

### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1997).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante (Mexico City, D.F.: 1998).

For all data included in Table 8-1, the distances used to estimate indicators; i.e., passenger-kilometers, were based on routes and traffic intensities.

Air: Data include only domestic airlines with scheduled service. General aviation activity is not included.

*Bus, total and intercity:* Data for all types of buses are nonexistent, because these data are not collected. In Table 8-1 only data for intercity buses are reported. These buses use Mexico's federal highway system, and do not include local transit buses. Intercity bus data for passenger-kilometers are estimates based on the size of the vehicle fleet and the following formula:

Passengers—kilometers = passengers transported x distance traveled.

Passengers transported = vehicle fleet x used capacity x trips per week x weeks per year

The vehicle fleet is the number of vehicles that move passengers on the federal road system. Used capacity is the average number of used seats per vehicle. Trips per week is the average number of trips per vehicle per week. Weeks per year is the average number of weeks an intercity bus is in service during the year. Distance traveled is the distance between the origin and destination of the bus.

### United States

Table 8-1 is based on the following primary sources:

#### Air:

Air carrier: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: 1986-1997). Page 2, Line 1.

General aviation: U.S. Department of Transportation. Federal Aviation Administration. Statistical Handbook of Aviation 1996, available at [www.bts.gov](http://www.bts.gov).

#### Road:

1990, 1995: U.S. Department of Transportation. Federal Highway Administration. *High-*

*way Statistics, Summary to 1995*. (Washington, DC: 1996). Table VM-201A.

1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table VM-1.

Local motor bus: American Public Transit Association (APTA). *Transit Fact book*. (Washington, DC: various years).

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996), statistical appendix.

Transit rail: American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

*Air:* Air data comprise air carrier and general aviation passenger-kilometers. Air carrier data in the United States are based on 100 percent reporting of passengers and trip length by the large certificated air carriers (including the medium regional carriers). There are some 90 air carriers that operate aircraft with a passenger seating capacity of more than 60, or have a payload capacity of more than 8,165 kilograms, or operate internationally. (See the technical notes under Table 4-2 for more information on large certificated air carriers.) The figures do not include data for all airlines; most notably, small certificated air carriers, scheduled commuter airlines and on-demand air taxis are excluded. If added, these might raise the totals by roughly 5 percent. Air carrier passenger-kilometers are computed by summing the aircraft kilometers flown on each inter-airport segment multiplied by the number of passengers carried on that segment. Passenger-kilometers for general aviation (which in this table includes on-demand air taxi) are calculated by increasing earlier figures by the percentage change in annual hours flown by general aviation aircraft, as published in the



Federal Aviation Administration's *Statistical Handbook of Aviation*.

**Road:** Road data are based on statistics compiled by the Federal Highway Administration (FHWA) at the U.S. Department of Transportation from data reported by each state. Road passenger-kilometers are calculated by multiplying the vehicle kilometers of travel by the average number of occupants for each vehicle type (as estimated by FHWA, using various sources, especially, the Nationwide Personal Transportation Survey). The quality of the data varies by the level of the functional road system and by each state's effort and adherence to FHWA methods. FHWA edits reports that are unreasonable because of obvious errors or large changes. In July 1997, FHWA published revised passenger-kilometers data for the road mode for several years. The major change reflected the reassignment of some vehicles from the passenger car category to the FHWA category "other 2-axle, 4-tire vehicles" (called "light truck" in this table). Light trucks include vans, pickup trucks, minivans and sport utility vehicles. Passenger cars include taxis. Bus totals are based on data from the FHWA and include charter, intercity, local motor bus and school bus. Local motor bus is based on data from a private association, and is described under transit. Road data *do not* include passenger travel by commercial freight vehicles.

**Transit:** Transit data are from the American Public Transit Association (APTA) and are based on information in the Federal Transit Administration's (FTA) National Transit Database. APTA conservatively adjusts the FTA data to include transit operators that do not report to this database. These nonreporting operators typically include private, very small and/or rural operators. There are about 6,000 transit operators in the U.S., according to APTA; about 1,000 of these report to FTA. However, these 1,000 operators ac-

count for approximately 90 to 95 percent of the total transit passenger-kilometers. Reliability of the U.S. transit data varies by mode. The numbers for rail are the most comprehensive; those for bus are less so because there are so many more operators. Transit passenger-kilometers are the cumulative sum of the distances ridden by each passenger. Transit total includes other U.S. transit categories not individually specified here, including local motor bus, trolley bus, ferries and transit for the disabled. Transit rail includes commuter rail, heavy rail and light rail. Local motor bus included here is not included in the total to avoid double counting with the estimate of bus passenger vehicle-kilometers in the road data.

**Intercity rail:** Intercity rail data are based on an almost 100 percent count of tickets from the service provider in the United States (Amtrak) and, therefore, are considered to be very accurate.

**Table 8-2a**  
**Top Canadian Domestic Passenger**  
**Metropolitan Area Pairs by Mode: 1996**

**Canada**

**Air:** Statistics Canada. *Air Passenger Origin and Destination, Domestic Report—1996, Catalogue 51-204-XPB*. (Ottawa, Ont.: 1997).

**All other modes:** Statistics Canada. *Micro Data Files relating to the Canadian Travel Survey (CTS)—1996, Catalogue 87M006XCB*. (Ottawa, Ont.: 1998).

**Air:** Air data in this table are based on scheduled domestic air passenger journeys by air carriers, as collected by the *Passenger Origin Destination Survey*. Air carrier figures refer to total outbound and inbound domestic passenger journeys in 1996. Statistics Canada's Aviation Statistics Centre developed



the *Passenger Origin-Destination Survey* to collect air passenger statistics. The *Air Passenger Origin and Destination Report, Catalogue 52-204-XPB*, is published annually to provide estimates, by directional origin and destination, of the number of passengers traveling on scheduled domestic commercial flights. These passenger counts are reported by major (Level I and certain Level II) air carriers to the *Passenger Origin-Destination Survey*. Approximately 85 percent of the total commercial air passengers in Canada are serviced by air carriers that participate in the *Passenger Origin-Destination Survey*. Data for general aviation/noncommercial passenger travel do not exist because this type of information is not collected. As a result, top metropolitan area pairs for domestic passengers transported by all air modes of transport in Canada is also nonexistent.

The data in Table 8-2a are based on passengers flown by Level I and Level II Canadian air carriers. To qualify as a Level I carrier, the carrier must have transported at least 1,000,000 revenue passengers or at least 200,000 metric tons of revenue goods in each of the 2 calendar years immediately preceding the report year. (Level I carriers are divided into Level IA and Level IB, with IA the larger.) Level II carriers must have transported at least 50,000 revenue passengers or at least 10,000 metric tons of revenue goods in each of the 2 calendar years immediately preceding the report year.

*Intercity rail/road/water:* Data in this table for Intercity Rail, Road, and Water are based on “person-trips,” as collected by Statistics Canada for its *Canadian Travel Survey (CTS)*. These figures refer to total outbound and inbound domestic passenger trips in 1996. For purposes of the *CTS*, a “trip” is defined as travel by the respondent accompanied or

not by one or more household members for any reason (except as noted below) to a Canadian destination of at least 80 kilometers one-way from home. The following types of travel are excluded: travel to and from work or school (i.e., commuting); one-way travel involving a change of residence; travel of operating crew members of buses, airplanes, boats, etc; travel in an ambulance to a hospital or clinic; trips that did not originate in Canada; trips longer than a year.

The *Canadian Travel Survey* is a biennial survey whose purpose is to gather information on domestic trips and travelers to measure the volume, characteristics and economic impact of domestic travel by Canadians. The *CTS* is a supplement using the *Labour Force Survey (LFS)* sampling frame and collects more than 30 characteristics, including socio-demographic information on travelers, trips and expenditures. In 1996, a monthly sample of approximately 16,000 persons was interviewed. That same year, additional information was also collected. For the first time, the *CTS* measured the number of visits and provided allocated expenditures at the national, provincial and subprovincial level. The results of the *Canadian Travel Survey* are published in *Touriscope-Domestic Travel* (Catalogue 87-504), which is prepared by the Tourism Statistics Program of Statistics Canada.

**Table 8-2b**  
**Top Mexican Domestic Passenger**  
**Metropolitan Area Pairs by Mode: 1996**

**Mexico**

Air: Instituto Mexicano del Transporte based on data from Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Querétaro, Qro.: 1998).

*Intercity rail and bus:* Data for 1996 are for passenger travel by interurban railroad and by bus are presented below for the principal

terminals. The objective is to provide an idea of the geographical distribution of passenger flows within Mexico by bus and rail.

### **Intercity Passenger Rail, 1996**

(Thousands of passengers utilizing specific terminals)

Name of passenger rail terminal	Thousands of passengers utilizing specific terminals, 1996
Mexico City, D.F.	728
Veracruz, Ver.	181
Guadalajara, Jal.	171
Monterrey, N.L.	160
Chihuahua, Chih.	141

Instituto Mexicano del Transporte based on data from Ferrocarriles Nacionales de México (Querétaro, Qro. 1998)

### **Intercity Passenger Bus, 1996**

(Thousands of passengers utilizing specific terminals)

Name of passenger bus terminal	Thousands of passengers utilizing specific terminals, 1996
Mexico City, D.F.	
Mexico City, D.F. (Terminal del Norte)	22,851
Mexico City, D.F. (Terminal Oriente)	17,164
Guadalajara, Jal.	16,501
Celaya, Gto.	13,799
Monterrey, N.L.	12,576
Acapulco, Gro.	10,087

Secretaría de Comunicaciones y Transportes. Dirección General de Autoransporte Federal. *Estadísticas Básicas del Autotransporte Federal, 1996.* (Mexico City, D.F. 1997)

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

*Air and water:* Air carrier is an Instituto Mexicano del Transporte estimate based on data provided from Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. Water data represent port pairs.

**Table 8-2c**  
**Top U.S. Domestic Passenger**  
**Metropolitan Area Pairs by Mode: 1995**

**United States**

U.S. Department of Transportation. Bureau of Transportation Statistics. *1995 American Travel Survey*. Special tabulation. (Washington, DC: 1996).

Conducted in 1995, the Bureau of Transportation Statistics' American Travel Survey (ATS) collected data on trips of 100 miles or more one-way made by U.S. residents. Flows between places less than 100 miles apart are not included in the data set. Flows are based on person trips between metropolitan areas. For more information on the ATS, see the web site: [www.bts.gov/ats](http://www.bts.gov/ats)

**SECTION 9: NORTH AMERICAN PASSENGER TRAVEL**

Canada and Mexico both collect data on same day and overnight international travel from travel surveys and other sources. However, the data sources for each country may differ in definitions and methodologies. Both Canada's and Mexico's data are based on country of residency. Residents of a country are those people that are entitled to live permanently in that country. For the purposes of the

travel data included in this section, resident travel would include travel by both citizens of the particular country, as well as, residents of that country.

The United States does not collect data on same day and overnight travel to and from the United States for all modes of transportation, and with the same level of travel characteristics that Canada and Mexico do. The International Trade Administration's *Survey of International Air Travelers* captures travel characteristics data for U.S. residents traveling abroad and for international visitors to the United States. However, the survey only captures travel by air. The Bureau of Transportation Statistics' *American Travel Survey* captures data on international travel of U.S. residents by all modes of transportation. However, the distance basis of the ATS (trips of 100 miles or more) limits its utility in the North American context, since the majority of U.S.-Canada and U.S.-Mexico travel is same day travel with trips of less than 100 miles. Because of these and other data gaps, the United States agreed to use Canadian data to represent U.S.-Canada travel and Mexican data to represent U.S.-Mexican data.

**Table 9-1a**  
**Canada-Mexico/Mexico-Canada Travel**  
**by Mode of Transportation**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

*Data sources:* The Tourism Statistical Program at Statistics Canada collects, analyzes and disseminates data on tourism. Tourism is broadly defined as the business, pleasure and leisure activities that support a person



travelling abroad. The existing method of collecting international travel statistics is described under the two Statistics Canada headings of "Frontier Counts" and "Questionnaire Surveys." Both these systems depend greatly on the cooperation of Revenue Canada, Customs and Excise in the collection of the number of crossings and the distribution of travel questionnaires. Except for Tables 9-2a and 10-1, all data in Sections 9 and 10 are based on a combination of frontier count and questionnaire sampling. Data for all tables in Section 9 are based on travel from Canada by Canadian residents and on travel to Canada by U.S. or Mexican residents.

*Frontier count data:* All ports of entry across Canada participate in determining the number of travelers by selected categories, by type of transportation, as well as the number of cars, trucks, motorcycles and bicycles in the case of highway and ferry points. These surveys are conducted on a census basis except for seven ports of entry that are using sampling schemes to estimate automobiles and motorcycle flows. The sample is intended to estimate U. S. and Canadian vehicles and travelers by country of residence. The samples are selected among the seven ports in order to represent all days of the month over the region. Custom officials at these ports provide the count of automobiles and cycle traffic by country of residence for those sample days. These counts are then weighted to the total flows provided by toll authorities.

*Questionnaire surveys:* Questionnaire surveys are used to secure information on the expenditures and other characteristics of an international traveler. According to prearranged schedules, Canadian Customs distributes the questionnaires to the travel party upon entry for nonresidents or upon reentry for Canadian residents. As part of a continuing at-

tempt to improve travel surveys at minimal cost, a sampling scheme is used at all major land and air border points where a questionnaire is distributed to eligible travelers over a period of several days. Each port involved in the sampling scheme receives, for a specified period, a specific quantity of numbered questionnaires and a date on which to start the distribution. For estimation purposes, the responses obtained through the questionnaire surveys are treated as a simple random sample from the total traffic in each stratum (port or group of ports, by type of traffic, by quarter). The data may in fact be subjected to some degree of "distribution bias," due to the fact that not all categories of travelers are represented, or to a "nonresponse bias" due to the fact that the individuals replying may not be representative of the population.

Data from questionnaire surveys are captured and disseminated on the basis of person-trips. (Each time a nonresident traveler enters Canada marks the beginning of a person-trip. Canada Customs records each traveler's entry. A person-trip concludes when the traveler leaves Canada. For residents, each time a person departs from Canada, a person-trip begins. The person-trip ends when the traveler returns to Canada.) However, for the purposes of comparability with Mexican and U.S. data, data in Sections 9 and 10 is reported on the basis of visitors, unless otherwise noted.

## Mexico

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

*Data sources:* The Banco de México is the responsible agency for collecting the majority of international travel data in Mexico. Most of these data are collected through survey



instruments. Overall, the goals of the Banco de México tourism survey program are to collect tourism data as part of the calculation of the balance of payments and to collect other information in order to analyze the behavior of tourists. To support these goals, data on expenditures for local transportation, lodging, food, amusement, personal care items, souvenirs, medical care and other purchases are gathered. In addition, data such as length of stay, income level, purpose of trip, means of transportation, point of departure and major cities visited also are gathered. Through a sample survey, data are collected at specific international airports and border cities. Data are collected from travelers in automobiles, buses, trains, as well as travelers boarding and deboarding aircraft. Each individual traveler is surveyed when leaving the country.

For the purposes of its own survey program, the Banco de México uses specific definitions to categorize types of visitors. However, due to the need for use of common terminology in Sections 9 and 10, some standard categories were used for the data tables. The category “Mexican Resident Overnight Travel to Canada” includes Mexican resident travelers who traveled from Mexico to Canada where they stayed for at least 24 hours. The category “Canadian Resident Overnight Travel to Mexico” includes Canadian resident travelers who traveled from Canada to Mexico where they stayed for at least 24 hours.

**Table 9-1b**  
**Canada-United States/United States-Canada Travel by Mode of Transportation**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries*

(*Touriscope*), *Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

See technical notes for Table 9-1a.

**United States**

For purposes of this publication, the United States and Canada have agreed to use Canadian source data for this table. However, the American Travel Survey (ATS) is another source that provides data for trips made by U.S. residents to Canada of more than 100 miles one-way in 1995. The ATS definition of a visitor, therefore, results in a much lower estimate of travel than reflected in the table, particularly for same-day travel. For overnight travel the ATS estimates 9,867,000 U.S. visitors to Canada in 1995, 76 percent of the travel estimated in the table. The ATS estimates a higher proportion of air travel (35 percent versus 21 percent) because, on the whole, it counts longer distance trips than in the table, trips that are more likely to be taken by airplane. The estimates of bus travel are very similar in percentage terms, with the ATS estimating 5 percent of trips versus 6 percent in the table. The ATS estimates 96 percent of bus trips were taken by charter or tour bus, 3 percent by intercity bus and 1 percent by school bus. The ATS estimates less than 1 percent of overnight trips to Canada were taken by intercity rail. For more information on the ATS, see web site: [www.bts.gov/ats](http://www.bts.gov/ats)

**Table 9-1c**  
**Mexico-United States/United States-Mexico Travel by Mode of Transportation**  
**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

See technical note on Table 9-1a for additional information on data sources.

The category "Mexican Resident Same Day Travel to the U.S." includes Mexican resident travelers who traveled from Mexico to the United States and who stayed within the border region (the border region extends 25 miles (40 kilometers) from the U.S./Mexican border). The category "U.S. Resident Same Day Travel to Mexico" includes U.S. resident travelers who traveled from the United States to Mexico and who stayed within the border region. The category "Mexican Resident Overnight Travel to the U.S." includes Mexican resident travelers who traveled from Mexico to the United States and who stayed in the United States for at least 24 hours. This includes Mexican residents who stayed within the border region, as well as those who traveled further inland into the United States for a minimum period of 24 hours. The category "U.S. Resident Overnight Travel to Mexico" includes U.S. resident travelers who traveled from the United States to Mexico and who stayed in Mexico for at least 24 hours. This includes U.S. residents who stayed within the border region, as well as those who traveled further inland into Mexico for a minimum period of 24 hours.

### United States

For purposes of this publication, the United States and Mexico have agreed to use Mexican source data for this table. The American Travel Survey (ATS) provides data for trips made by American residents to Mexico of more than 100 miles one-way in 1995. The ATS definition of a visitor, therefore, results in a much lower estimate of travel than reflected in the table, particularly for same-day travel. For overnight travel the ATS estimates 8,561,000 U.S. visitors to Mexico in 1995, 45 percent of the travel estimated in the table. The ATS estimates a higher proportion of air travel because it counts longer

distance trips than in the table, trips that are more likely to be taken by airplane. The only estimates of bus travel are from the ATS, which estimates bus accounts for 3 percent of trips. The ATS estimates 51 percent of bus trips were taken by charter or tour bus, 46 percent by intercity bus and 3 percent by school bus. The ATS estimates less than 1 percent of overnight trips to Mexico were taken by intercity rail. For more information on the ATS, see <http://www.bts.gov/ats>

**Table 9-2a**  
**Top Land Passenger Ports, Canadian-U.S. Border: 1996**

Northbound (Canadian data source): Statistics Canada. Culture, Tourism and the Center for Education Statistics Division. Special tabulations. (Ottawa, Ont.: 1998). Table 9-2a is based on data collected through Statistics Canada's Frontier Count program. These data provide information on the number of travelers by selected categories and by type of transportation. All ports of entry across Canada participate in determining the number of travelers by selected categories, by type of transportation, as well as the number of cars, trucks, motorcycles and bicycles in the case of highway and ferry points. These surveys are conducted on a census basis except for seven ports of entry that are using sampling schemes to estimate automobiles and motorcycle flows. The sample is intended to estimate United States and Canadian vehicles and travelers by country of residence. The samples are selected among the seven ports in order to represent all days of the month over the region. Custom officials at these ports provide the count of automobiles and cycle traffic by country of residence for those sample days. These counts are then weighted to the total flows provided by toll authorities.

Southbound (U.S. data source): U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

Data reflect all passenger vehicles and passengers in those vehicles that entered the United States across the U.S.-Canadian border, regardless of nationality.

**Table 9-2b**  
**Top Land Passenger Ports, Mexican-U.S. Border: 1996**

Northbound (U.S. data source): U.S. Department of Treasury. U.S. Customs Service. Office of Field Operations. *Operations Management Database*. Special tabulation. (Washington, DC: 1998).

Data reflect all passenger vehicles and passengers that entered the United States across the U.S.-Mexican border, regardless of nationality.

Southbound: Data compiled by Texas A&M International University, Texas Center for Border Economic and Enterprise Development based on original data from bridge operators. Web site: [www.tamui.edu/coba/txcntr/](http://www.tamui.edu/coba/txcntr/)

**Table 9-3**  
**Top North American Air Passenger City Pairs: 1996**

**Canada-United States and  
Mexico-United States**

U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *T-100 Database*. Special tabulation. (Washington, DC: 1998).

Data for this table are based on regulatory reporting requirements for the large certificated U.S. air carriers and for foreign air car-

riers. The large certificated U.S. air carriers are required to report traffic data for all their aircraft operations, regardless of aircraft size. (See the technical notes under Table 4-2 for the definition of "large certificated air carrier.") By contrast, the United States does not require foreign air carriers operating in the United States, such as Air Canada, to file "small aircraft" traffic operations. In the context of this table, small aircraft have 60 or fewer passenger seats and an available payload capacity (passengers and/or cargo) of 18,000 pounds (8,165 kilograms) or less. The United States requires foreign carriers operating in the United States to report data for aircraft with more than 60 passenger seats or available payload (passengers and/or cargo) of more than 18,000 pounds (8,165 kilograms).

**Table 9-4a**  
**Canada-Mexico/Mexico-Canada Travel  
by Trip Purpose**

Canadian data source: Statistics Canada. *International Travel, travel between Canada and other countries* (Touriscope), Catalogue 66-201-XPB. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Also see notes for Table 9-1a. Under Statistics Canada's International Travel Program, trip purposes include the following: pleasure, business, visiting friends or relatives and other purposes. A pleasure trip includes a holiday, vacation, visiting second home, cottage or condo and attending events and attractions. A business trip includes attending a meeting or convention, a conference, trade show or seminar, or other work. A trip for other purposes includes personal, in transit, shopping, educational study and other.



Mexican data source: Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

See notes for Table 9-1a.

**Table 9-4b**

**Canada-United States/United States-Canada Travel by Trip Purpose**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 9-1a and 9-4a.

**Table 9-5a**

**Canada-Mexico/Mexico-Canada Travel Characteristics: 1996**

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 9-1a and 9-4a.

**Table 9-5b**

**Canada-United States/United States-Canada Travel Characteristics: 1996**

**Canada**

Statistics Canada. *International Travel, travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

See notes for Table 9-1a and 9-4a.

**SECTION 10: INTERNATIONAL PASSENGER TRAVEL BETWEEN NORTH AMERICA AND THE REST OF THE WORLD**

**Table 10-1**

**Passenger Travel Between North America and the Rest of the World by Mode of Transportation**

**All Countries**

Canadian, Mexican and U.S. data in this table do not include international travel within North America. All data in this table are based on the traveler's country of residency. Residents of a country are those people that are entitled to live permanently in that country. For the purposes of the travel data included in this section, resident travel would include travel by both citizens of the particular country, as well as, residents of that country. Canadian data represent nonresident visitors to Canada, excluding residents of the United States and Mexico. U.S. data represent nonresident visitors to the United States, excluding residents of Canada and Mexico. Mexican data represent nonresident visitors to Mexico, excluding residents of Canada and the United States.

Travel from the United States is based on the departures of U.S. residents, excluding travel to Canada or Mexico. Travel from Mexico is based on the departures of Mexican residents, excluding travel to Canada or the United States. Travel from Canada is based on Canadian resident reentry data. Canadian resident reentry data represent Canadian residents returning from international destinations, other than the United States or



Mexico. The reentry of Canadian residents to Canada may be made directly from an overseas country or via the United States. Canadian resident reentry data are similar, but not exactly comparable with U.S. and Mexican resident departure data. This is because Canadian residents may not necessarily leave and return by the same modes of transportation, and because Canadian residents could depart Canada in one calendar year, and return in another.

### Canada

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Table 10-1 is based on data collected through Statistics Canada's Frontier Count program. These data provide information on the number of travelers by selected categories and by type of transportation. All ports of entry across Canada participate in determining the number of travelers by selected categories, by type of transportation, as well as the number of cars, trucks, motorcycles and bicycles in the case of highway and ferry points. These surveys are conducted on a census basis except for seven ports of entry that are using sampling schemes to estimate automobiles and motorcycle flows. The samples are selected among the seven ports in order to represent all days of the month over the region. Custom officials at these ports provide the count of automobiles and cycle traffic by country of residence for those sample days. These counts are then weighted to the total flows provided by toll authorities.

In Table 10-1, Canadian data are based on the traveler's country of residency. Travel

to Canada represents nonresident visitors to Canada, excluding residents of the United States and Mexico. Travel from Canada is based on Canadian resident reentry data. Canadian resident reentry data represent Canadian residents returning from international destinations, other than the United States or Mexico. The reentry of Canadian residents to Canada may be made directly from an overseas country or via the United States. Canadian resident reentry data are similar, but not exactly comparable with U.S. resident departure data. This is because Canadian residents may not necessarily leave and return by the same modes of transportation, and because Canadian residents could depart Canada in one calendar year, and return in another.

### Mexico

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999).

Table 10-1 is based on data collected by the Banco de México. Most of this data are collected through survey instruments. Overall, the goals of the Banco de México tourism survey program are to collect tourism data as part of the calculation of the balance of payments and to collect other information in order to analyze the behavior of tourists. To support these goals, data on expenses on local transportation, lodging, food, amusement, personal care items, souvenirs, medical care and other purchases are gathered. In addition, data such as length of stay, income level, purpose of trip, means of transportation, point of departure and major cities visited also are gathered. Through a sample survey data are collected at specific international airports and border cities. Data are collected from travelers in automobiles, buses, trains, as well as travelers boarding and deboarding

aircraft. Each individual traveler is surveyed when leaving the country.

For the purposes of its own survey program, the Banco de México uses specific definitions to categorize types of visitors. However, due to the need for use of common terminology in Sections 9 and 10, some standard categories were used for the data tables. The category *Travel to Mexico (Nonresident Visitors)* represents nonresident visitors to Mexico, excluding residents of the United States and Canada. The category *Travel from Mexico (Mexican Residents)* includes departures from Mexico by Mexican residents.

### United States

U.S. Department of Commerce. International Trade Administration. Tourism Industries Office. *Summary of International Travelers to the U.S. and 1996 Outbound Travel*. (Washington, DC: 1997).

*Travel to the United States:* Travel to the United States represents travel by visitors who are not U.S. residents. Nonresident visitor data are based on international arrivals by air to the United States. These data are collected by the Immigration and Naturalization Service (INS) on form I-94. Canadian and Mexican residents are excluded from the data in Table 10-1 for nonresident visitors traveling by air to the United States. The INS data system makes it impossible to obtain data for other modes without including travel by Canadian and Mexican residents. The INS estimates that in 1996, 303,000 visitors (including residents of Canada and Mexico) came to the United States by water transportation. In 1995, visitors by water transportation were 269,000 and in 1990, 279,000.

*Travel from the United States:* Travel from the United States represents departures by U.S.

residents. U.S. resident departures data by air are primarily based on data collected by the Immigration and Naturalization Service (INS) on form I-92, supplemented by the *Survey of International Air Travelers*, which is conducted by the International Trade Administration (ITA) at the Department of Commerce. The I-92 is completed by air carriers, and provides data for the number of U.S. residents traveling abroad by air. The *Survey of International Air Travelers* provides data on the travel characteristics of U.S. residents traveling abroad by air. Figures for U.S. resident departures in Table 10-1 excludes U.S. residents who were departing to Canada and Mexico.

Data for travel from the United States in Table 10-1 are based on the number of resident departures by air, and not the number of country visits. In addition, the total number of air passengers (travel to and from the United States) in this table is based on a roundtrip and, therefore, differs from the total number of air passengers shown in Table 10-3, which is based on a one-way trip. In Table 10-1 U.S. residents traveling abroad are counted only once when they leave the country, and foreign residents are counted only once when they enter the country. In Table 10-3 U.S. residents are counted twice: once when leaving and once when returning. Similarly, foreign residents are counted twice: once when entering and once when leaving. Other differences between this table and Table 10-3 are due to the differing data sources. (Table 10-1 is based on immigration data, supplemented by an air travel survey. Table 10-3 is based on air carrier data.)

**Table 10-2**  
**Top International Origins and**  
**Destinations Outside of North**  
**America: 1996**

**All Countries**

Data in this table do not include international travel within North America. For Canada, the United States and Mexico are not included as destinations. For the United States, Mexico and Canada are not included as destinations. For Mexico, Canada and the United States are not included as destinations. In addition, destination country data for all three countries include visits by their residents to one or more countries outside North America.

For countries of origin, Canadian data exclude residents of Canada, the United States and Mexico, even if the travel of a Canadian, U.S. or Mexican resident originated in a third country, such as the United Kingdom. Similarly, for countries of origin, U.S. data exclude residents of the United States, Canada and Mexico, even if the travel of a U.S., Canadian or Mexican resident originated in a third country, such as the United Kingdom. Mexican data for regions of origin exclude residents of Canada, the United States and Mexico.

**Canada**

Statistics Canada. *International Travel, Travel between Canada and other countries (Touriscope), Catalogue 66-201-XPB*. (Ottawa, Ont.: various years).

Statistics Canada. Special tabulations. (Ottawa, Ont.: 1998).

Also see technical notes for Table 9-1a.

*Country of origin:* Canada Customs counts nonresident travelers upon their entry into Canada. A selected sample of these nonresi-

dents receive a travel questionnaire that ask a number of selected questions pertaining to the type of trip taken (travel characteristics). One such characteristic is the residency of the respondent and the length of stay while in Canada. Country of origin data in this table are based on visits to Canada of one or more nights. Canadian data in Table 10-2 exclude residents of the United States and Mexico, even if the travel of a U.S. or Mexican resident originated in a third country, such as the United Kingdom.

*Destination country:* Destination country data reflect the reported places visited by Canadian residents while travelling to foreign destinations. Destination country visits are for at least one night. Canadian residents, upon their reentry to Canada, are sampled as to the travel characteristics of the trip just completed. Among the many travel characteristics asked of the Canadian traveler are what countries were visited and how much time was spent in each.

**Mexico**

Banco de México. Dirección General de Investigación Económica. Dirección de Medición Económica. (Mexico City, D.F.: 1999). Information on the travelers country of origin and destination is not available because it is not processed. Therefore, data have been presented at the regional level. The region of origin or destination is based on the region furthest in distance from Mexico or the region where the traveler spent the most time.

**United States**

U.S. Department of Commerce. International Trade Administration. Tourism Industries Office. *Summary of International Travelers to the U.S. and 1996 Outbound Travel*. (Washington, DC: 1997).



*Country of Origin:* Origin country data represent the residency of international arrivals based on data collected by the Immigration and Naturalization Service (INS) on form I-94. The I-94 is a requirement of all international visitors to the United States with the exception of Canadians visiting the United States for less than 6 months and Mexicans travelling within the 40-kilometer border frontier zone. U.S. country of origin data in Table 10-2 exclude residents of Canada and Mexico, even if the travel of a Canadian or Mexican resident originated in a third country, such as the United Kingdom. U.S. origin country data are based on country of residency. Hence, if a citizen of France, who is a permanent resident of Germany, travels to the United States from his home in Germany, he will be recorded as a person coming from Germany.

*Destination Country:* Destination countries are based on data collected by the Immigration and Naturalization Service (INS) on form I-92, supplemented by the *Survey of International Air Travelers*, which is conducted by the International Trade Administration (ITA) at the Department of Commerce. The I-92 is completed by air carriers, and provides data for the number of U.S. residents traveling abroad by air. The *Survey of International Air Travelers* provides data on the travel characteristics of U.S. residents traveling abroad by air.

It should be noted that destination country data for the United States include *visits* by U.S. residents to one or more countries. For example, if a U.S. resident departed and flew first to the United Kingdom for 3 days, then went to France for another 7 days, and then returned to the United States, this person's travel would be counted twice, in terms of destination countries: once with a visit to the

United Kingdom and once with a visit to France. This methodology differs from the approach to calculate the overall number of U.S. international passengers (nonresident visitors plus resident departures) in Table 10-1 because Table 10-1 is based on the number of air travelers, and not the number of country visits, which is the basis of Table 10-2.

The Bureau of Transportation Statistics' 1995 American Travel Survey (ATS) also provides data on the amount of international overseas travel by U.S. residents. Data from this survey provide generally lower estimates of the amount of overseas travel by U.S. residents as well as a somewhat different ranking of destination countries. Part of the difference in the top ATS destination countries versus the top destination countries according to the *Survey of International Air Travelers* is that the ATS is based on overseas travel by all modes of transportation. The top ten ATS destinations (excluding Canada and Mexico) were, in thousands of visitors: United Kingdom (1,846), Bahamas (1,581), Jamaica (971), France (944), Italy (833), Germany (823), Japan (608), India (508) Bermuda (487) and Aruba (416).

**Table 10-3**  
**Top International Air Gateways,**  
**Excluding North American Travel: 1996**

#### **Mexico**

Aeropuertos y Servicios Auxiliares. *Resultado del Movimiento Aeroportuario. Enero-Diciembre, 1996.* (Mexico City, D.F.: 1997).

Data for this table are based on airline reports provided to the Aeropuertos y Servicios Auxiliares, which is the agency responsible for overseeing Mexico's major airports. One



of the most important uses of this information is to plan services at airports for both airlines and air passengers.

Data in this table differ from those in Table 10-1, because they are based on air carrier data reported to the Aeropuertos y Servicios Auxiliares. In contrast, the data in Table 10-1 are survey data collected as part of the Banco de Mexico's tourism and travel program. For more information on this program see the notes for Table 9-1a and 9-1c.

### United States

U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *T-100 Database*. (Washington, DC: 1998).

These data are based on regulatory air carrier data and represent the total passengers (both outbound and inbound traffic in flight segments) in scheduled and nonscheduled service of all U.S. and non-U.S. airlines to and from all international cities (other than Canadian and Mexican cities). This data source is different from the data source used for Table 10-1 that shows the number of international passengers by air (a sum of nonresident visitors and resident departures). Table 10-1 is based on immigration data, supplemented by an air travel survey. Table 10-3 is based on air carrier data and the number of passengers (regardless of country of residency).

In addition, data for international air travel differ between Table 10-1 and Table 10-3 because the total number of air passengers with international origins and destinations in this table is based on a round-trip and, therefore, differs from the number of air passengers (a sum of nonresident visitors and resident departures) shown in Table 10-1, which is based on a one-way trip. Because Table

10-3 is based on air carrier data, a traveler is counted twice: once when leaving and once when returning. In Table 10-1, however, the U.S. traveler is counted only once when she leaves the country, and a foreign (nonresident) traveler is counted only once when he enters the country.

In Table 10-3, New York consists of three airports (John F. Kennedy International (16.3 million international passengers), Newark (3.7 million) and La Guardia (0.2 million)). Washington, DC consists of 2 airports (Dulles International (2.5 million) and National (0.02 million)). Data for Guam were not included in this table, but if they were, Guam would rank number 7 with 2.97 million international passengers.

## SECTION 11: TRANSPORTATION INFRASTRUCTURE

**Table 11-1**  
**Domestic Physical System Extent**

### All Countries

For road, the overall total for Canada and the United States includes all roads (highways, local and others). However, the road total for Mexico does not include local roads. For the road subcategories, Canada cannot disaggregate its data for local roads into paved and unpaved. The rail data represent the length of track, including yard tracks, sidings and parallel lines. The transit rail data refer to one-way, fixed guideways.

### Canada

Table 11-1 is based on the following primary sources:

Road: Transportation Association of Canada. *Transportation in Canada: A Statistical Overview—1995*. (Ottawa, Ont.: 1998).

Great Lakes and inland waterways: Transport Canada. *Marine Distance Library*, 1997. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue 55-201-XPB and Gas Utilities, Transport and Distribution Systems, Catalogue 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB*. (Ottawa, Ont.: various years).

Road: It is not possible to present data according to the subcategories of major roads and local roads, which are included in Table 11-1. However, an overall total number as well as an overall number for paved and unpaved roads is available. For these figures, road length is based on a concept of a "two lane equivalent," where a "two-lane equivalent" is a length of road measured as if there were only two lanes. For example, in this table, a 1-kilometer stretch of road with two regular lanes and one passing lane down the middle counts as 1.5 kilometers. Data for 1996 do not exist because the source of this data for 1990 and 1995 in Table 11-1 was a report entitled *Transportation in Canada: A Statistical Overview*, prepared for the Transportation Association of Canada (TAC), under contract. This particular report followed two earlier TAC publications: *Highways in Canada*, last published in 1991 and *Transportation in Canada*, last published in 1993. It is not known when a subsequent edition of *Transportation in Canada: A Statistical Overview*, will be issued or whether a subsequent edition will contain road extent data beyond year 1995.

The public road network in Canada extends slightly more than 900,000 kilometers. Approximately 35 percent of the network is paved, 57 percent has a gravel surface (in-

cluding "surface treatment") and only 8 percent remains unsurfaced (such as dirt and winter roads. Winter roads are roads that are built in the winter over frozen lakes, rivers and muskeg). The Canadian National Highway System (NHS) consists of 24,449 route-kilometers of roads linking major cities, major international border crossings and ports. Although it comprises less than 3 percent of the Canadian road network, the Canadian National Highway System supports the bulk of both the interprovincial and international trade in goods and inter city passenger travel.

Great Lakes and inland waterways: Distances for the Great Lakes and inland waterways were calculated with use of an automated marine distance library developed by the Economic Analysis Directorate of Transport Canada. The total distance of Canada's inland Waterways (2,825 kilometers) includes that distance along the St. Lawrence River from the Ontario-Québec border, along Québec's north shore to the meridian of latitude 63° West (a distance of 1,029 kilometers) and the distance in U.S. waters in the Great Lakes system (1,796 kilometers).

The Great Lakes Region consists of those Canadian ports that are located along the St. Lawrence River west of the Ontario-Québec border, and on the four Great Lakes, which include Lake Ontario, Lake Erie, Lake Huron and Lake Superior. Canada's Inland Waterways Region consists of all rivers, lakes and other navigable fresh waters within Canada including the St. Lawrence River as far seaward as a straight line drawn from Cap-des-Rosier to West Point, Anticosti Island, and from Anticosti Island to the north shore of the St. Lawrence River along the meridian of longitude 63° West. This area excludes the Mackenzie River and its tributaries, but includes time spent in U.S. waters of the St.

Lawrence River and the Great Lakes, where the St. Lawrence River Region consists of Canadian ports located on the St. Lawrence River from the Ontario-Québec border eastward, along the north shore to 63° West.

**Pipeline:** Natural gas pipeline data include pipeline used for the gathering, transmission and distribution of natural gas, but exclude gathering lines for the upstream producing industry. The length of natural gas pipeline also excludes pipeline used for the residential distribution of natural gas. Crude oil pipeline data include pipelines used for gathering, trunk-crude and product lines, but exclude upstream producers' gathering lines.

**Rail:** Data include freight and intercity passenger rail only. Rail track length for 1990 and 1995 includes rail lines owned or operated under lease, contract, trackage rights, or jointly owned and includes mainline, branch line and yard trackage. Data for 1995 indicate the length of track operated as of December 31, 1994.

### **Mexico**

**Road:** Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 y 1996.* (Mexico City, D.F.: various years).

**Pipeline:** Instituto Nacional de Estadística, Geografía e Informática, based on data from the Petróleos Mexicanos. Subdirección de Planeación and the *Anuario Estadístico* (various years). (Aguascalientes, Ags.: various years).

**Rail:** Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996.* (Mexico City, D.F.: various years).

**Transit:** Instituto Nacional de Estadística,

Geografía e Informática, based on data collected by the Sistema de Transporte Colectivo and the Sistema de Transporte Eléctrico in Mexico City, the Sistema de Transporte Colectivo de la Zona Metropolitana in Guadalajara, and the Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).

**Road:** The total length of the national road network includes toll and nontoll roads as well as feeder rural roads. Local roads within municipal areas are not included.

**Rail:** The total length of rail under operation, including main, secondary and private railroads.

**Transit:** Data include the Sistema de Transporte Colectivo, Mexico City's tramway and Guadalajara's and Monterrey's electric trains (Metrorrey).

### **United States**

Table 11-1 is based on the following primary sources:

**Road:** U.S. Department of Transportation. Federal Highway Administration (FHWA). Special tabulation. (Washington, DC: 1998).

**Great Lakes and inland waterways:** U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

**Gas pipeline:** American Gas Association. *Gas Facts.* (Arlington, VA: 1997). Table 5-1 and similar tables in earlier editions.

**Oil pipeline:** Eno Transportation Foundation, Inc. *Transportation in America.* (Lansdowne, VA: 1997). Page 64.

**Freight rail:** Association of American Railroads. *Railroad Facts.* (Washington, DC: 1997). Page 44.



Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996). Statistical Abstract.

Transit rail: American Public Transit Association. *Transit Fact book 1996*. (Washington, DC: 1996).

Road: Road data for "major roads" include U.S. Interstate and arterials. Data for local roads include both collectors and local roads. Data for 1990 and 1995 do not include Puerto Rico, but data for 1996 do include Puerto Rico in all road categories.

Great Lakes and inland waterways: Data represent an estimated length of the U.S. Great Lakes and inland waterways on which commercial traffic was reported to the U.S. Army Corps of Engineers. Great Lakes data refer to domestic commercial traffic between U.S. Great Lakes ports. Inland waterways are defined as those geographically located within the boundaries of the contiguous 48 states or within the boundaries of the State of Alaska.

Pipeline: Gas pipeline data include transmission pipelines, distribution, main and field gathering lines, but exclude service pipes. Gas pipeline data are not adjusted to common diameter equivalent, and data are reported at the end of each year. Oil pipeline data include petroleum and other liquid product lines, including gathering lines.

Rail: Rail data include length of track owned, including yard tracks, sidings and parallel lines by the National Railroad Passenger Corporation (Amtrak) and Class I freight railroads. Class I railroads have annual gross operating revenues in approximate excess of \$250 million (based on 1991 dollars) and comprise only 2 percent of the railroads in the U.S., but account for about 70 percent of

the industry's distance operated (73 percent in 1996), 90 percent of its employees and 90 percent of its freight revenues. Portions of the freight, intercity passenger and commuter rail networks share common trackage in the United States. Jointly used rail track is only counted once in U.S. statistics.

Transit rail: Transit rail data include commuter rail, heavy rail and light rail. Data are one-way, fixed guideway.

## **Table 11-2**

### **Number of Airports**

For all countries, data in Table 11-2 *do not* include heliports, stolports (an airport specifically designed for short take-off and landing aircraft, separate from conventional airport facilities) and seaplane bases.

### **Canada**

Table 11-2 is based on the following primary sources:

All data, except percent of control towers: Natural Resources Canada. *Canada Flight Supplement*. (Ottawa, Ont.: 1998). Airport facilities information provided to Natural Resources Canada for publication in *Canada Flight Supplement* by NAV CANADA. 1998.

Percent with control towers: Transport Canada. *Aircraft Movement Statistics, TP577*. (Ottawa, Ont.: 1998).

The number of Canadian heliports is excluded from the data in Table 11-2. In 1990 there were 314 heliports; in 1995 and 1996, there were 313. Of these heliports, there were 204 (1990), 210 (1995) and 211 (1996) heliports that were either certified and/or operated by the Canadian Department of National Defense.

In Canada, an aerodrome is a generic name for facilities that are registered with Trans-



port Canada as aircraft landing and take-off sites. Aerodromes are identified and described in *Canada Flight Supplement*, a publication produced on a monthly basis, under the authority of Nav Canada and Canada's Chief of Defense Staff, by Geometrica Canada, Department of Natural Resources. Most of Canada's commercial aviation activity takes place at certified airports. Some aerodromes are privately owned but the majority of the certified airports in Canada are owned by municipalities, provincial/territorial governments, or the federal government.

### Mexico

Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1997).

*Certified airports:* Data represent those airports managed by Aeropuertos y Servicios Auxiliares, the Secretaría de Comunicaciones y Transportes, the Secretaría de la Defensa Nacional (Ministry of National Defense), the Secretaría de Marina (Ministry of the Navy), and state and municipal governments.

### United States

Table 11-2c is based on the following primary sources:

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. (Washington DC: 1997). Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

U.S. Department of Transportation. Federal Aviation Administration. *Administrator's Fact Book*. (Washington, DC: December 1993 and August 1998).

U.S. Department of Transportation. Federal Aviation Administration. Private Communication. (Washington, DC: 1998).

*Total airports:* Data for the number of total airports in Table 11-2 include only civilian

and joint-use civilian-military airports in the United States and its territories. Purely military airports are excluded. These data *do not* include heliports, stolports (an airport specifically designed for short take-off and landing aircraft, separate from conventional airport facilities) and seaplane bases. If data for heliports, stolports and seaplane bases were added to the number of civilian and joint-use airports, the total would be: 1990: 17,490; 1995: 18,224; and 1996: 18,292.

*Certified airports:* Data for certified airports are based on those airports that serve air carrier operations with aircraft seating more than 30 passengers. In 1990, there were 680 certified civilian, joint-use civilian-military and military airports. A breakout of civilian and joint-use certified airports versus purely military certified airports is not available for earlier than 1994. In 1994 and 1995, there were 95 purely military certified airports and in 1996, there were 94 purely military certified airports.

*Data sources:* The data are based on information collected by the FAA Office of Airport Safety and Standards "through physical inspections and mail solicitations, and reported on the *Airport Master Record* (Form FAA 5010-1) and the *FAA Landing Facilities Information Request on Airports, Heliports, Stolports, and Seaplane Bases* (Forms FAA 5010-2 and 5010-5)." For additional definitions and more information on U.S. airports, see chapter three of the *FAA Statistical Handbook of Aviation*.

### Tables 11-2a, b and c Top Airports by Flight Operations: 1996

Canadian and U.S. data in Tables 11-2a and 11-2c report the total number of *civilian itinerant operations* of commercial air carriers

and general aviation. Military operations and local operations have been excluded. Definitions of local and itinerant operations are as follows:

*Local:* Local operations are performed by aircraft that:

- (1) Operate in the local traffic pattern or within sight of the airport
- (2) Are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile (32-kilometer) radius of the airport
- (3) Execute simulated instrument approaches or low passes at the airport.

*Itinerant:* Itinerant operations are all aircraft operations other than local operations. Mexican data in Table 11-2 b report the total number of civilian local *and* itinerant operations of commercial air carriers and general aviation. This differs from U.S. and Canadian data in Tables 11-2a and 11-2c where local operations have been excluded. However, the above definitions of local and itinerant still apply.

#### **Table 11-2a**

##### **Top 20 Canadian Airports by Flight Operations: 1996**

###### **Canada**

Table 11-2a is based on the following primary sources:

Flight operations: Transport Canada. *Aircraft Movement Statistics, TP 577*. (Ottawa, Ont.: 1998).

Airport characteristics: Natural Resources Canada. *Canada Flight Supplement*. (Ottawa, Ont.: 1998) Airport facilities information provided to Natural Resources Canada for

publication in *Canada Flight Supplement* by NAV CANADA. 1998.

#### **Table 11-2b**

##### **Top 20 Mexican Airports by Flight Operations: 1996**

###### **Mexico**

Aeropuertos y Servicios Auxiliares. *Resultado del Movimiento Aeroportuario, Enero-Diciembre de 1996*. (Mexico City, D.F.: 1997).

The number of flight operations includes scheduled and nonscheduled commercial aviation and general aviation at airports managed by the Aeropuertos y Servicios Auxiliares.

#### **Table 11-2c**

##### **Top 20 U.S. Airports by Flight Operations: 1996**

###### **United States**

This table is based on the following primary sources:

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation-1996*. (Washington DC: 1997). Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

Flight operations: U.S. Department of Transportation. Federal Aviation Administration. Office of Aviation Policy and Plans. Information Systems Branch. Private Communication. (Washington, DC: 1998).

Airport characteristics: U.S. Department of Transportation. Federal Aviation Administration. Office of Airport Safety and Standards. Airport Safety and Operations Division, based on FAA Airport Master Record, Form FAA 5010. Special tabulation. (Washington, DC: 1998).

See also the G.C.R. & Associates, Inc. web site: [www.gcr1.com/](http://www.gcr1.com/) (Click on Links and then on FAA 5010 Database.)

The data on number of flight operations (i.e., number of takeoffs plus number of landings) are reported to the FAA by the airport traffic control towers. The FAA *Statistical Handbook of Aviation* reports itinerant plus local operations. However, for this table, the FAA supplied an unpublished list showing total civilian *itinerant* operations. The FAA *Statistical Handbook of Aviation* also reports a great deal of information on the U.S. airspace system, including the top 50 airports (technically, the top 50 FAA-Operated Airport Traffic Control Towers) ranked in order of total operations, with the data broken out by aviation category (air carrier, air taxi, general aviation, military). Detailed data on activity at individual facilities can be found in the report, FAA *Air Traffic Activity*.

**Table 11-3**  
**Number of Water Ports and Facilities**

**Canada**

Statistics Canada. Transportation Division. Special tabulation. (Ottawa, Ont.: 1998).

*Total ports:* Data for the total number of ports in this table include marine ports or facilities reporting domestic and international cargo as reported on either Statistics Canada's *Domestic Shipping Report* or Revenue Canada's Customs Declarations. (See notes for Table 11-4a for a description of statistical instruments used by Statistics Canada to report domestic and international cargoes that are handled by Canadian ports).

*Definitions of regions:* The Atlantic region consists of Canadian ports on the Atlantic Ocean and Arctic Waters, and that portion of the Gulf of St. Lawrence that is east of the inland waters as defined in the Canadian Shipping Act. Data for Canadian Atlantic ports in this table include ports in Canadian Arctic waters and facilities that are located at Hibernia and Sable Island (off-shore drilling sites). The Pacific region consists of Canadian ports located on the Pacific Coast. The Great Lakes Region consists of Canadian ports located along the St. Lawrence River west of the Ontario-Québec border, and on the Great Lakes. Data for Canadian inland ports in this table include ports located on the St. Lawrence River and the Mackenzie Delta. (The St. Lawrence River Region consists of Canadian ports located on the St. Lawrence River from the Ontario-Québec border eastward, along the north shore to 63° west longitude and along the south shore to Cap-des-Rosiers.)

**Mexico**

Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

The number of ports includes the oil facilities located in Cayo Arcas, in front of the coast of the state of Campeche.

**United States**

U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

The number of U.S. ports for a particular year represents any U.S. port with annual activity of greater than one U.S. short ton, either do-



mestic or foreign. The only facility included in this count of ports and facilities is the Louisiana Offshore Oil Platform (LOOP). The category *Caribbean* includes ports in Puerto Rico and the U.S. Virgin Islands.

**Table 11-4a**  
**Top 20 Canadian Water Ports by Tonnage (Domestic and International): 1996**

**Canada**

Statistics Canada. *Shipping in Canada, Catalogue 54-205-XPB, 1996*. (Ottawa, Ont.: 1998).

Statistics Canada. Transportation Division. Special tabulations. (Ottawa, Ont.: 1998).

*Domestic tonnage:* Information on domestic shipping is collected from the *S.1 Domestic Shipping Report* and the *S.4 Towboat and Ferry Operators Shipping Report*. The S.4 report is used on Canada's west coast only. A record of activity is filed with Statistics Canada for each vessel entering or leaving a Canadian port in domestic shipping, with the exception of: cargo vessels under 15 net registered tons; tugs or other vessels under 15 gross register tons; Canadian naval or fishing vessels; research vessels; and ballast movements for towboat and ferry operators on the West Coast that are reporting on S.4 reports.

*International tonnage:* International commodity statistics are compiled from data collected on the A6 General Declaration and supporting cargo reports supplied to Statistics Canada by Revenue Canada, Customs and Excise, or equivalent reports from shipping lines and port authorities. Coverage extends to all vessels entering or leaving Canadian ports while engaged in international shipping with the exception of: fishing vessels of both

Canadian or foreign registry for which there is no foreign port reported on the A6 report; maintenance and service vessels such as ice-breakers; research vessels; and, other non-commercial vessels such as hospital ships. Data include intransit shipments.

*Containerized shipments/entrances and clearances:* The metric tonnage of total international and domestic containerized freight in 1996 was 17,911,000 metric tons. The total number of entrances and clearances of ships at all Canadian ports in 1996 was 93,170 ships.

**Table 11-4b**  
**Top 20 Mexican Water Ports by Tonnage (Domestic and International): 1996**

**Mexico**

Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Containerized cargo does not include the containers, only their contents. Data include in-transit shipments.

**Table 11-4c**  
**Top 20 U.S. Water Ports by Tonnage (Domestic and International): 1996**

**United States**

*Tonnage:* U.S. Army Corps of Engineers. *Waterborne Commerce of the United States, National Summaries, Part 5*. (New Orleans, LA: 1996).

*Percent of containerized shipments:* U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).



*Domestic tonnage:* Domestic tonnage data by port are based on domestic waterborne traffic movements that are reported to the U.S. Army Corps of Engineers (USACE) by all vessel operators of record. In summarizing domestic commerce, certain movements are excluded: cargo carried on general ferries; coal and petroleum products loaded from shore facilities directly into bunkers of vessels for fuel, and insignificant amounts of government materials moved on government owned equipment in support of USACE projects. Domestic tonnage data are based on the traffic of the contiguous and noncontiguous U.S. states and territories constituting the geographical space upon which domestic commerce may be transported. This includes Hawaii, Alaska, the 48 contiguous states, Puerto Rico and the Virgin Islands, Guam, American Samoa, Wake Island and U.S. Trust Territories. The subtotal for domestic tonnage of the top 20 ports represents the total tons moving in and out of the top 20 ports, excluding duplications. (For example, tonnage moving between Houston, TX and Corpus Christi, TX is counted only once in the subtotal for domestic tonnage of the top 20 ports.)

*International tonnage:* International tonnage data by port are primarily based on data for official U.S. international waterborne merchandise trade. This data include international merchandise imports to and exports from the United States that moved by water modes of transportation. In this table and in data reported by the U.S. Army Corps of Engineers, these data are supplemented by intransit shipments to provide port figures for international tonnage. Intransit shipments are shipments moving from one non-U.S. country to another non-U.S. country via a port or facility in the United States. Intransit shipments are not considered part of official U.S. international merchandise trade, but

these shipments do utilize and impact U.S. port infrastructure.

*Containerized shipments/entrances and clearances:* Data for containerized shipments are based on international containerized shipments plus domestic containerized shipments. Domestic containerized shipments are estimated based upon the vessel type and/or the vessel operating company moving the cargo. Commercial vessel movement into and out of water ports excludes fishing vessels. Data represent both loaded and unloaded vessels.

**Table 11-5**  
**Toll Roads, Bridges and Tunnels**

**Canada**

Table 11-5 is based on the following primary source:

Transport Canada. Highway Policy Group. Special tabulation. (Ottawa, Ont.: 1998).

Data in this table include 11 international bridges and 1 international tunnel on the U.S. Canadian border.

**Mexico**

Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 and 1996.* (Mexico City, D.F.: various years).

Data comprise the private sector (concessionaires), federal and state governments.

**United States**

U.S. Department of Transportation. Federal Highway Administration. *Toll Facilities in the United States: Bridges, Roads, Tunnels, Ferries.* (Washington, DC: various years).

Data are based on a survey of facilities (in operation, financed, or under construction)

conducted by the Federal Highway Administration in cooperation with state highway agencies. Data include Puerto Rico. Data are for January 1 of the reference year. Toll roads excludes the length of roadway on toll bridges/tunnels and parts of toll roads that are used toll free by local residents. Toll bridge facilities made up of more than one bridge are counted only once. Toll tunnel facilities made up of more than one tube are counted only once.

## SECTION 12: TRANSPORTATION VEHICLES

**Table 12-1**  
**Number of Transportation Vehicles/  
Equipment**

### All Countries

Data for the number of road motor vehicles are approached differently in each of the three countries. At the overall level, the data are comparable. However, for the specific road subcategories, there are some definitional differences between Canada, Mexico and the United States, especially in terms of light trucks. Light trucks include vehicles such as sports utility vehicles, vans, pick-up trucks, mini-vans and jeeps. In Canada, light trucks are included in the overall total for the number of road motor vehicles, but light trucks are not included in the Canadian data for personal vehicles or in the data for commercial freight vehicles. In the United States, light trucks are included within personal vehicles and can be differentiated from passenger cars. Therefore the U.S. and Canadian data for the number of personal vehicles are not exactly comparable. Mexico has included light trucks in both its overall total for road motor vehicles as well as in its total for personal vehicles, although light trucks cannot be differentiated from passenger cars. Light trucks

used for business purposes are included in Mexico's total for commercial freight vehicles, while those used for personal reasons are included in Mexico's total for personal vehicles.

### Canada

Table 12-1 is based on the following primary sources:

Air: International Civil Aviation Organization. *Civil Aircraft on Register. Digest of Statistics No. 437.* (Montréal, Que.: 1998).

Passenger cars, motorcycles, school buses: Statistics Canada. *Road Motor Vehicles, Registrations, Catalogue 53-219-XPB, 1997.* (Ottawa, Ont.: various years).

Charter, intercity and local motor buses: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue 53-215-XPB.* (Ottawa, Ont.: various years).

Commercial freight vehicles: Statistics Canada. *Trucking in Canada, Catalogue 53-222-XPB.* (Ottawa, Ont.: various years).

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB.* (Ottawa, Ont.: various years).

Transit: Statistics Canada. *Passenger Bus and Urban Transit, Catalogue 53-215-XPB.* (Ottawa, Ont.: various years).

Water transport: Lloyd's Register of Shipping. *Statistical Tables—1990 Table 2 and World Fleet Statistics—Tables 2,* Editions 1995 and 1996. (London, UK: various years).

Air: Aircraft data in this table are based on regulatory definitions established by the Transportation Safety Board of Canada. Commercial aircraft include the following types of Canadian registered aircraft used by Canadian air operators that offer a "for-hire" service to transport people or goods, or to

undertake specific tasks such as aerial photography, flight training and crop spraying: (1) airliner (2) commuter aircraft and (3) air taxi or specialty aircraft. For specific definitions of all of these commercial aircraft types, refer to the technical notes for Table 3-1. General aviation aircraft, as defined by the Transportation Safety Board of Canada, includes Canadian registered aircraft that are used by private operators, which include individuals flying for pleasure and companies flying for business reasons, or state operators, which include the federal and provincial governments. Canadian air data in Table 12-1 are from the International Civil Aviation Organization (ICAO) publication, *Aircraft Register*. This publication, *Aircraft Register*, inventories Canada's aircraft equipment by type (jet/nonjet) and use (air carrier/commercial operations or general aviation).

*Commercial aircraft:* In Table 12-1, commercial aircraft data include jets and nonjets. Jets include all commercial turbo-jet aircraft. Nonjets include all commercial propeller driven (turbine and piston) fixed wing type aircraft and all commercial rotary wing (turbine and piston) aircraft. Jet and nonjet Canadian commercial aircraft include Canadian registered aircraft that are used by Canadian air operators whose air operations are grouped by air carrier reporting levels I to VI (which includes a rating associated with the amount of revenue generated by their commercial air carrier operations).

*General aviation:* General aviation data include all noncommercial turbo-jet aircraft; all noncommercial propeller driven (turbine and piston) nonjet fixed wing type aircraft; and all noncommercial rotary wing (turbine and piston) aircraft.

*Road, total:* Under road data, overall totals include Canadian vehicle registrations recorded in the vehicle registration files of Canada's ten provinces and two territorial regions and compiled by Statistics Canada for its annual publication *Road Motor Vehicles—Registrations*. Vehicle type categories in Canada's registration files include: passenger automobiles (including taxis and for-hire cars); trucks and truck tractors; buses (separated between school buses and other); motorcycles; registered mopeds; and, "other road motor vehicles" (including vehicles such as ambulances, fire trucks etc.). These categories do not correspond directly with the vehicle type categories used in Table 12-1. Although the total includes all registered vehicles, the table categories of personal vehicles, buses and commercial freight vehicles are based on data that indicate *only a portion* of the total number of Canadian vehicle registrations.

*Road, personal vehicles (passenger cars, motorcycles and light trucks):* The total for personal vehicles represents only passenger automobiles and motorcycles. Passenger car data include registered passenger cars, taxis and for-hire cars. Motorcycle data include registered motorcycles and mopeds. Light trucks (such as mini-vans and pick-ups) are not a distinct category in Canada's vehicle registration files, but are included in the category of "trucks and truck tractors." Light trucks cannot be separated from the total number of "trucks and truck tractors" in Canada's vehicle registration files. Therefore, separate data for light trucks are non-existent and *no* light trucks have been included in the total for personal vehicles.

*Road, commercial freight vehicles:* The data in this category are based on two sources;



provincial motor vehicle registration files and Statistics Canada's *Motor Carriers of Freight Survey*. In Canada's motor vehicle registration files, "commercial freight vehicles" is not a unique category. As a result, the total number of commercial freight vehicles, as well as the totals for the subcategories of single-unit trucks and tractors, are primarily derived from Statistics Canada's *Motor Carriers of Freight Survey*, supplemented with some data from vehicle registration files, as described below.

Data for single-unit trucks and tractors in Table 12-1 are based on data from Statistics Canada's *Motor Carriers of Freight Survey*. Data from this survey represent estimated numbers for single-unit trucks and tractors that are operated by owner operators and/or Canadian for-hire carriers (or trucking companies) that earn annual revenues greater than or equal to \$25,000 Canadian dollars.

Data for the total number of commercial freight vehicles are based on the data from the *Motor Carriers of Freight Survey* and on the supplementary vehicle registration data. The supplementary data from Canada's motor vehicle registration files represent "other motor vehicles," such as ambulances, fire trucks and specialized commercial motor vehicles. It should also be noted that the commercial freight vehicle data in Table 12-1 do not correspond to the "trucks and truck tractors" category in Canada's vehicle registration files. The "trucks and truck tractors" category in Canada's vehicle registration files includes smaller trucks, smaller truck tractors and light trucks (such as mini-vans and sports utility vehicles) and also includes trucks that are privately operated. These types of vehicles have been included *only* in the overall total for the number of road motor vehicles Table 12-1.

*Road, buses:* Buses include charter, intercity, local motor (or transit) and school buses. The overall bus total, as well as the number of school buses, is based on provincial and territorial vehicle registration files and reported in Statistics Canada's annual publication, *Road Motor Vehicles-Registrations*. Bus data for charter, intercity and local motor buses are based on a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus and charter and other types of bus service (Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*). Statistics Canada conducts this survey on a quarterly basis with an annual supplement. Prior to 1994, the survey program was restricted to those companies earning \$500,000 Canadian dollars or more. Beginning in 1994, the survey was expanded to include companies earning \$200,000 or more.

*Rail:* Rail data for freight cars include Canadian Class I and Class II railways. Freight locomotives include Class I and Class II railways and both freight and yard-type locomotives. Rail data for intercity passenger, train cars and locomotives include Class I (VIA Rail) and Class II railways.

*Transit:* Transit data are estimates of numbers of vehicles (revenue equipment operated), including rail transit vehicles and buses owned and leased, and are derived from a sample of Canadian companies engaged in urban transit bus service and used in Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*. The total number of transit vehicles includes light rail transit vehicles, heavy rail transit vehicles, commuter rail vehicles and both "owned" and "leased" revenue motor bus vehicles operated for urban transit passenger service (i.e., standard motor bus, low floor



motor bus, trolley coach, articulated bus and other buses). Data for transit railcars include light rail vehicles, heavy rail vehicles and commuter rail vehicles.

**Water transport:** Lloyd's Register of Shipping has granted permission for use of their data on Canadian flag vessels for years 1990, 1995 and 1996. These data are published in Table 2 of Lloyd's Register, *Statistical Tables 1990* and in Tables 2A, 2B, 2C, 2D and 2E of Lloyd's Register, *World Fleet Statistics* (1996 and 1997 editions). The data on Canadian flag vessels that are published in the Lloyd's Registry are Canadian flag vessels, registered in Canada, in accordance with conditions identified in Sections 6, 7 and 8 of Part 1, *Canada Shipping Act* (Chapter S-9).

Other passenger vessels include passenger/ro-ro cargo and passenger/general cargo vessels. Tanker vessels include liquefied gas, chemical, oil, oil/chemical tankers and other liquid carriers. Dry bulk vessels include dry bulk, ore/bulk/oil carriers, ore/bulk carriers, self-discharging dry bulk, bulk and other dry bulk carriers. Specialized carrier vessels includes specialized and refrigerated cargo carriers. General cargo includes general cargo, ro-ro cargo and other dry cargo vessels. Dry cargo/barge vessels include general cargo vessels and barges. Fishing vessels include fish catching, fishing (including factory ships) and other fishing vessels. Fishing vessels include fish catching, fishing (including factory ships) and other fishing vessels. However there is a considerable undercount of fishing vessels due to the exclusion of vessels under 15 gross registered tons. Offshore vessels include offshore supply and other offshore vessels. Other vessels include research, dredging and all other types of vessels.

## Mexico

**Air:** Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1990-1996*. (Mexico City, D.F.: 1997).

**Rail:** Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

**Road:** Instituto Nacional de Estadística, Geografía e Informática based on data collected by the Departamento del Distrito Federal, Dirección General de Autotransporte Urbano, Direcciones de Policía y Tránsito Estatales y Municipales. (Mexico City, D.F.: various years).

**Transit:** Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Sistema de Transporte Colectivo y Eléctrico in Mexico City, the Sistema de Transporte Eléctrico de la Zona Metropolitana in Guadalajara and the Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).

**Water:** Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

**Air:** Commercial aircraft includes aircraft from scheduled, charter and freight airlines and air taxis. General aviation includes private and official aircraft. For 1990, 714 air taxis are included in the total for commercial aircraft. The corresponding numbers for 1995 and 1996 are 1,051 and 950, respectively. It is not possible to separate air taxis into jets and nonjets

Road: Road data come from the statistics of the *Motor Vehicles Registered Under Circulation*. The subcategory of personal vehicles is comprised of private cars, some light trucks, cabs and official vehicles. The subcategory of commercial freight vehicles represents medium and heavy trucks and also may include some light trucks. Data for intercity buses and commercial freight vehicles represent only vehicles that are permitted, by regulation, to use the federal highway system.

Rail: Only a total for locomotives can be reported because they are used interchangeably, and not specifically dedicated to passenger or to freight trains.

### United States

Table 12-1 is based on the following primary sources:

#### Commercial aircraft:

U.S. Department of Transportation. Federal Aviation Administration. *Administrator's Fact Book*. (Washington, DC: August 1998 and December 1996).

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation-1996*. (Washington DC: 1997). Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

General aviation: U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation-1996*. (Washington, DC: 1997). Tables 8.1, 8.2, 8.3. Web site: [api.hq.faa.gov/handbook/1996/toc96.htm](http://api.hq.faa.gov/handbook/1996/toc96.htm)

U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Air Taxi Activity Survey*. (Washington DC: April 1998). Tables 1.1 and 1.3. Web site: [api.hq.faa.gov/ga96/gatoc.htm](http://api.hq.faa.gov/ga96/gatoc.htm)

Road: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Tables MV-1, 7, 9, 10 and 11.

Local motor bus: American Public Transit Association. *Transit Fact Book 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact Book 1996*. (Washington, DC: 1996).

Freight rail: Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997). Pages 48 and 50.

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996). Statistical Abstract.

#### Water transport:

Recreational and fishing boats: U.S. Department of Transportation. U.S. Coast Guard. Office of Marine Safety. *Merchant Vessels of the United States*. (Washington, DC: 1998).

All other vessels: U.S. Army Corps of Engineers. Navigation Data Center. *Waterborne Transportation Lines of the United States, Calendar Year 1996*. (New Orleans, LA: 1997).

Air: The total number of aircraft has been rounded to the nearest 100 because the standard deviation in the number of general aviation aircraft does not allow greater precision. (See discussion below.)

Commercial aircraft: Data for commercial aircraft in Table 12-1 include *all* aircraft that are reported as being in operation by U.S. air carriers and that carry passengers or cargo for hire, both scheduled and nonscheduled service. On-demand air taxis *are* included with commercial aircraft in Table 12-1, as reported in the FAA *Administrator's Fact Book*.

(Excluding on-demand air taxis, the commercial aircraft numbers are: 1990: 6,083; 1992: 7,320; 1995: 7,411; and 1996: 7,478. See Chapter 5 of the FAA *Statistical Handbook of Aviation* for more information on the U.S. air carrier fleet (including the jet/nonjet breakdown) when on-demand air taxis are excluded.) The commercial aircraft data in Table 12-1 were developed from reports collected by the FAA from the carriers; that is, the data are a *total count* of the aircraft reported to the FAA as being *used* in air carrier service. (Note that this is different from an inventory of aircraft *owned* by the air carriers.) The FAA keeps this data in its Vital Information System (VIS).

*General aviation:* General aviation data are based on a FAA mail survey, the *General Aviation and Air Taxi Activity (and Avionics Survey)* (hereafter referred to as *Survey*). This survey uses a scientifically designed random sample that represents all general aviation aircraft and on-demand air taxis registered in the United States. The *Survey* data include only aircraft in active use. The general aviation data in Table 12-1 exclude on-demand air-taxis because they have been included with commercial aircraft, as explained above. Because the general aviation data are derived from a sample, there is sampling error. Thus, in some of its tables, the FAA rounds the totals to the nearest 100. The standard deviation on the *Survey's* totals for general aviation aircraft plus on-demand air taxis is, however, considerably larger than 100. Standard deviations are given explicitly in the FAA *Statistical Handbook of Aviation*, chapter 8 and in the *Survey* itself.

As stated above, Table 12-1 combines on-demand air taxis and air carrier aircraft into the category commercial aircraft. Thus, to derive the numbers for general aviation in

Table 12-1, the *Survey's* data for on-demand air taxis have been subtracted from the *Survey's* totals for general aviation aircraft plus on-demand air taxis. (It is important to note that the *Survey* underestimates on-demand air taxis, and the *Survey's* numbers for on-demand air taxis do not agree with the on-demand air taxi data in the FAA's Vital Information System.) If numbers for on-demand air taxis from the *Survey* are *included* in the total for general aviation aircraft, the totals are, 1990: 196,800; 1992: 185,700; 1995: 182,600; and 1996: 187,300. These are the same totals that are reported for the number of general aviation aircraft plus on-demand air taxis in chapter eight of the FAA *Statistical Handbook of Aviation* and chapter one of the *Survey*.

*Road:* Road data are based on statistics compiled by the Federal Highway Administration (FHWA) at the U.S. Department of Transportation from reports submitted by the states. In 1995, FHWA revised the data series for the number of U.S. road vehicles. The new categories include passenger car, light trucks ("other 2-axle, 4-tire vehicles"), "single-unit 2-axle 6-tire or more truck" and combination truck tractors. Pre-1993 data were assigned to the closest available category. Data for light trucks or "other 2-axle, 4-tire vehicles" include vans, pick-up trucks and sport/utility vehicles. "Single-unit 2-axle 6-tire or more trucks" are on a single frame with at least two axles and six tires, and correspond to the category of single-unit trucks in Table 12-1. Combination truck tractors correspond to the category of tractors in Table 12-1. Passenger cars include taxis. The total for buses is based on FHWA estimates and include intercity, charter, school and local motor bus. The estimate of local motor buses is based on data from the American Public



Transit Association (APTA) (see transit section for a description). All road data represent registered vehicles in the U.S., except local motor buses that are active passenger vehicles.

*Rail:* Rail data for rail freight include in-service freight cars and locomotives belonging to Class I railroads and car companies and freight shippers. Class I railroads have annual gross operating revenues in approximate excess of \$250 million (based on 1991 dollars) and comprise only 2 percent of the railroads in the U.S., but account for about 70 percent of the industry's distance operated, 90 percent of its employees and 90 percent of its freight revenues. Data for intercity passenger rail only include in-service intercity cars and locomotives. Of the total number of freight railcars in Table 12-1, a large share belong to shippers and railcar companies. In 1990, 658,902 freight cars belonged to shippers and rail car companies. In 1995 and 1996, the corresponding numbers were 583,486 and 570,865, respectively.

*Transit:* Transit data are from the American Public Transit Association (APTA) and are based on information in the Federal Transit Administration's (FTA) National Transit Database. APTA conservatively adjusts the FTA data to include transit operators that do not report to this database. These nonreporting operators typically include private, very small and/or rural operators. There are about 6,000 transit operators in the U.S., according to APTA. Only about 1,000 of these report to FTA. However, these 1,000 operators account for approximately 90 to 95 percent of the total transit passenger-kilometers. Reliability of the U.S. transit data varies by mode. The numbers for rail are the most comprehensive; those for bus are less so because there are so many more operators. Transit total includes other U.S. transit

categories not individually specified here, including local motor bus, ferries, and transit for the disabled. Transit railcars includes light railcars, heavy railcars and commuter rail cars and locomotives.

*Water transport:* Water data for all vessels, except other passenger vessels, recreational boats and fishing vessels, are based on U.S. Army Corps of Engineers (USACE) data. USACE data are derived from an annual survey of vessels available for operation in domestic waterborne trade as of December 31 of the respective year. USACE vessel data have been organized in this table according to the International Classification of Ship Type (ICST) system. The ICST category for "miscellaneous types, other" includes research vessels or dredges. Because the USACE data represent vessels engaged in waterborne commerce, research vessels and dredges, are excluded from USACE data. Therefore, the United States cannot provide data for this ICST category. USACE data also represent U.S. flagged vessels. A U.S. flagged vessel is one that is U.S. operated, but not necessarily U.S. owned.

Data on passenger vessels, recreational boats and fishing vessels are from the U.S. Coast Guard's (USCG) *Merchant Vessels of the United States* publication. Under USCG definitions a recreational boat is one used for pleasure purposes with a weight greater than 5 deadweight tons. The USCG defines fishing vessels as those that "commercially engage in the catching, taking, or harvesting of fish or an activity that can reasonably be expected to result in the catching, taking, or harvesting of fish." Data for other passenger vessels are obtained from the Coast Guard's Marine Safety Information System Database, and are considered noncruise passenger vessels.



**Table 12-2**  
**Vehicle-Kilometers by Mode**

### Canada

Table 12-2 is based on the following primary sources:

Road: Transport Canada. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998).

Rail: Statistics Canada. *Rail in Canada, Catalogue 52-216-XPB*. (Ottawa, Ont.: various years).

Bus: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue 53-215-XPB*. (Ottawa, Ont.: various years).

Domestic aircraft-kilometers for Canadian Level I to Level IV air carriers were last reported in 1987. Road vehicle-kilometers for personal vehicles and commercial freight vehicles (but not for bus) are based on a Transport Canada estimate for 1995 of the numbers of vehicle kilometers traveled by passenger motor vehicles, light trucks and commercial freight vehicles. Estimates of vehicle-kilometers are calculated based on: (1) road motor vehicle fuel sales (net sales on which taxes were paid at road-use rates); and (2) estimates of fuel efficiency by class of vehicle. Domestic intercity passenger rail kilometers include Class I and II services. All bus data are from a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus and charter and other types of bus service from Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*.

### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Air data include only kilometers traveled by national lines under scheduled operation in domestic and international service. Rail data include vehicle activity by the entire railroad system, which during the years 1990, 1995 and 1996 was operated by one company.

### United States

Table 12-2 is based on the following primary sources:

Air carrier: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: 1986-1997). Page 2, Line 27, plus Line 50.

General aviation: U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Air Taxi Activity (and Avionics) Survey*. (Washington, DC: 1990, 1995 and 1996). Table 3.3. Web site: [api.hq.faa.gov/ga96/gatoc.htm](http://api.hq.faa.gov/ga96/gatoc.htm)

Road:

1990, 1995: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996). Table VM-201A.

1996: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997). Table VM-1.

Local motor bus: American Public Transit Association (APTA). *Transit Fact Book 1996*. (Washington, DC: 1996).

Transit: American Public Transit Association. *Transit Fact Book 1996*. (Washington, DC: 1996).

Freight rail: Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997). Page 33.

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996). Statistical Abstract.

National Railroad Passenger Corp. State and Local Affairs Department and Public Affairs Department. Private communication. (Washington, DC: 1998).

Air: Air total includes data for domestic air carriers and general aviation. Air data for domestic air carrier vehicle-kilometers in the United States are based on 100 percent reporting of passengers and trip length by some 90 large certificated air carriers (including the medium regional carriers) that operate aircraft with a passenger seating capacity of more than 60, or have a payload capacity of more than 8,165 kilograms, or operate internationally. (For additional information on the definition of large certificated air carrier, see the technical notes for Table 4-2). The figures do not include data for all airlines; most notably, small certificated air carriers, scheduled commuter airlines and on-demand air taxis are excluded. If added, these might raise the totals by roughly 13 percent in 1995. In this table, general aviation includes on-demand air taxis, corporate flying, sightseeing and personal flying and some other forms of flying but excludes military flying. Vehicle miles are estimates derived from the Federal Aviation Administration's *General Aviation and Air Taxi Activity Survey*.

Road: Road data include passenger cars, motorcycles and light trucks. Passenger cars include taxis. Road data are based on statistics compiled by the Federal Highway Administration (FHWA) at the U.S. Department of Transportation from reports by the states. In 1995, the U.S. Department of Transportation, Federal Highway Administration (FHWA) revised its vehicle type categories for data from 1993 and later. The new categories include passenger car, the FHWA category "other 2-axle, 4-tire vehicles" (called "light truck" in this table), single unit trucks ("single-unit 2-axle 6-tire or more truck") and combination trucks. Pre-1993 data were assigned to the closest available category. Data for light trucks include vans, pick-up trucks and sport/utility vehicles. Single-unit trucks are on a single frame with at least two axles and six tires, and correspond to the category of single-unit trucks in Table 12-2. Combination truck tractors correspond to the category of tractors in Table 12-2. In January 1997, the FHWA published revised vehicle-kilometers data for the highway mode for several years. The major change reflected the reassignment of some vehicles from the passenger car category to the light truck category. Bus totals are based on data from the FHWA and include charter, intercity, local motor bus and school bus. Local motor bus data are based on data from a private association. (See below for a description.)

Transit: Transit data are from the American Public Transit Association (APTA) and are based on information in the Federal Transit Administration's (FTA) National Transit Database. APTA conservatively adjusts the FTA data to include transit operators that do not report to this database. These nonreporting

operators typically include private, very small and/or rural operators. There are about 6,000 transit operators in the U.S., according to APTA—about 1,000 of these report to FTA. However, these 1,000 operators account for approximately 90 to 95 percent of the total transit passenger-kilometers. Reliability of the U.S. transit data varies by mode. The numbers for rail are the most comprehensive; those for bus are less so because there are so many more operators. Transit total includes other U.S. transit categories not individually specified here, including local motor bus, trolley bus, ferries and transit for the disabled. Transit rail includes commuter rail, heavy rail and light rail and is based on car-kilometers.

*Rail:* Rail freight train-kilometers are based on Class I railroads in the United States. Class I railroads had annual gross operating revenues in approximate excess of \$250 million (based on 1991 dollars) and comprised only 2 percent of the railroads in the U.S., but accounted for about 70 percent of the industry's distance operated, 90 percent of its employees and 90 percent of its freight revenues. Train-kilometers are based on the distance run between terminals and/or stations.





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a p p e n d i x

C

## Reference Resources



# appendix C

## Reference Resources

This appendix provides additional reference materials for many of the data tables. Included in this appendix are: acronyms for data sources, currency exchange rates, state and provincial abbreviations, U.S.-metric conversion ratios, land port names for the Canadian-U.S. and Mexican-U.S. borders and the two-digit commodity codes and descriptions of the Harmonized Schedule for international merchandise trade.

### SOURCE ACRONYMS

This acronym list represents many of the Canadian, Mexican and U.S. government and nongovernment sources used in this publication, but should not be viewed as exhaustive. This list of acronyms should *not* be viewed as a comprehensive list of government or nongovernmental organizations and associations that maintain and analyze transportation and transportation related data in any of the three countries.

#### Canadian Identified Sources

##### *Canadian Government Agencies*

NRCan	Natural Resources Canada
STC	Statistics Canada
TSB	Transportation Safety Board of Canada
TC	Transport Canada
<i>Nongovernmental Organizations</i>	
CN	Canadian National
CPR	Canadian Pacific Railway
NAVCAN	NAV CANADA
SLSMC	St. Lawrence Seaway Management Corporation
TAC	Transportation Association of Canada

#### Mexican Identified Sources

INEGI	Instituto Nacional de Estadística, Geografía e Informática (National Institute of Statistics, Geography and Informatics)
DGCNES y P	Dirección General de Contabilidad Nacional, Estudios Socioeconómicos y Precios (General Directorate of National Accounts, Socioeconomic Studies and Prices)
DGE	Dirección General de Estadística (General Directorate of Statistics)
DCSE	Dirección de Censos de Sectores Económicos (Directorate General of Economic Census)
DECP	Dirección de Estadísticas de Corto Plazo (General Directorate of Short Term Statistics)
DEE	Dirección de Estadísticas Económicas (Directorate of Economic Statistics)
DGG	Dirección General de Geografía (General Directorate of Geography)
SCT	Secretaría de Comunicaciones y Transportes (Ministry of Communications and Transportation)
ASA	Aeropuertos y Servicios Auxiliares (Airports and Auxiliary Services)

**Mexican Identified Sources—Continued**

CGPMM	Coordinación General de Puertos y Marina Mercante (General Coordination of Ports and Merchant Marine)
DGAC	Dirección General de Aeronáutica Civil (General Directorate of Civil Aeronautics)
DGAF	Dirección General de Autotransporte Federal (General Directorate of Federal Motor Carriers)
DGP	Dirección General de Planeación (General Directorate of Planning)
DGPFC	Dirección General de Policía Federal de Caminos y Puertos (General Directorate of Federal Highway and Port Patrol)
FERRONALES/ FNM	Ferrocarriles Nacionales de México (National Railroads of Mexico)
IMT	Instituto Mexicano del Transporte (Mexican Institute of Transport)
BANXICO	Banco de México (Bank of Mexico)
CONAE	Comisión Nacional para el Ahorro de Energía (National Commission for Energy Conservation)
METRORREY	Sistema de Transporte Eléctrico de la ciudad de Monterrey (Electric Public Transport (Transit, Trolley and Light Rail) System for the Monterrey Metropolitan Zone)
PEMEX	Petróleos Mexicanos (Mexican Petroleum Company)
SE	Secretaría de Energía (Ministry of Energy)

**Mexican Identified Sources—Continued**

SECOFI	Secretaría de Comercio y Fomento Industrial (Ministry of Trade and Industrial Development)
SECTUR	Secretaría de Turismo (Ministry of Tourism)
SHCP	Secretaría de Hacienda y Crédito Público (Ministry of Finance and Public Credit)
SPP	Secretaría de Programación y Presupuesto (Ministry of Planning and Budgeting)
STC	Sistema de Transporte Colectivo (Metro) (Public Transport (Transit) System for the Mexico City Metropolitan Zone)
STE	Sistema de Transporte Eléctrico (Electric Public Transport (Transit, Trolley and Light Rail) System for the Mexico City Metropolitan Zone)
STEZMG	Sistema de Transporte Eléctrico de la Zona Metropolitana de Guadalajara (Electric Public Transport (Transit, Trolley and Light Rail) System for the Guadalajara Metropolitan Zone)

**United States Identified Sources***U.S. Government Agencies*

DOC	Department of Commerce
Census	U.S. Census Bureau
BEA	Bureau of Economic Analysis
ITA	International Trade Administration
TIO	Tourism Industries Office
DOD	Department of Defense
USACE	U.S. Army Corps of Engineers
DOE	Department of Energy



## United States Identified Sources—Continued

### U.S. Government Agencies—Continued

EIA	Energy Information Administration
ORNL	Oak Ridge National Laboratory
DOL	Department of Labor
BLS	Bureau of Labor Statistics
DOT	Department of Transportation
BTS	Bureau of Transportation Statistics
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
MARAD	Maritime Administration
NHTSA	National Highway Traffic Safety Administration
OST	Office of the Secretary
RSPA	Research and Special Programs Administration
STB	Surface Transportation Board
SLSDC	St. Lawrence Seaway Development Corporation
USCG	United States Coast Guard
EPA	Environmental Protection Agency
NTSB	National Transportation Safety Board

## United States Identified Sources—Continued

### U.S. Nongovernmental Organizations

AAR	American Association of Railroads
AGA	American Gas Association
AMTRAK	National Railroad Passenger Corporation (Amtrak)
API	American Petroleum Institute
APTA	American Public Transit Association
ENO	ENO Transportation Foundation
TRB	Transportation Research Board

## International Organizations

GATT	General Agreement on Tariffs and Trade
IMF	International Monetary Fund
ICAO	International Civil Aviation Organization
Lloyd's Register	Lloyd's Register of Shipping
OECD	Organization for Economic Cooperation and Development
UN	United Nations
WB	World Bank
WTO	World Trade Organization

## INTERNATIONAL CURRENCY EXCHANGE RATES

	1990	1995	1996
<b>Canada</b> (Units of Canadian dollars per U.S. dollar)	1.1668	1.3724	1.3635
<b>Mexico</b> (Units of Mexican pesos per U.S. dollar)	2.8126	6.4194	7.6009

Source: International Monetary Fund, *International Financial Statistics Yearbook 1997*, Period Averages of Market Exchange Rates. (Washington, DC: 1998)

## STATE AND PROVINCIAL ABBREVIATIONS

### Canadian Provinces, Territories and Abbreviations

Province-Territory	Abbreviation
Alberta	Alta.
British Columbia	B.C.
Manitoba	Man.
New Brunswick	N.B.
Newfoundland	Nfld.
Northwest Territories	N.W.T.
Nova Scotia	N.S.
Nunavut*	Nvt.
Ontario	Ont.
Prince Edward Island	P.E.I.
Quebec	Que.
Saskatchewan	Sask.
Yukon Territory	Y.T.

\*Effective April 1, 1999, Nunavut was created as an administrative/geographical region of Canada from partitioning of the Northwest Territories.

### Mexican States and Abbreviations

Mexican state	Abbreviation
Aguascalientes	Ags.
Baja California	B.C.
Baja California Sur	B.C.S.
Chihuahua	Chih.
Colima	Col.
Campeche	Camp.
Coahuila	Coah.
Chiapas	Chis.
Distrito Federal	D.F.
Durango	Dgo.
Guerrero	Gro.
Guanajuato	Gto.
Hidalgo	Hgo.
Jalisco	Jal.
Michoacán	Mich.
Morelos	Mor.
México	Edo. de Méx.
Nayarit	Nay.
Nuevo León	N.L.
Oaxaca	Oax.
Puebla	Pue.
Quintana Roo	Q. Roo

## Mexican States and Abbreviations—Continued

Mexican state	Abbreviation
Querétaro	Qro.
Sinaloa	Sin.
San Luis Potosí	S.L.P.
Sonora	Son.
Tabasco	Tab.
Tlaxcala	Tlax.
Tamaulipas	Tamps.
Veracruz	Ver.
Yucatán	Yuc.
Zacatecas	Zac.

### U.S. States and Abbreviations

U.S. state	Abbreviation
Alabama	AL
Alaska	AK
Arizona	AZ
Arkansas	AR
California	CA
Colorado	CO
Connecticut	CT
Delaware	DE
District of Columbia	DC
Florida	FL
Georgia	GA
Hawaii	HI
Idaho	ID
Illinois	IL
Indiana	IN
Iowa	IA
Kansas	KS
Kentucky	KY
Louisiana	LA
Maine	ME
Maryland	MD
Massachusetts	MA
Michigan	MI
Minnesota	MN
Mississippi	MS
Missouri	MO
Montana	MT
Nebraska	NE
Nevada	NV
New Hampshire	NH

**U.S. States and Abbreviations—Continued**

U.S. state	Abbreviation
New Jersey	NJ
New Mexico	NM
New York	NY
North Carolina	NC
North Dakota	ND
Ohio	OH
Oklahoma	OK
Oregon	OR
Pennsylvania	PA
Rhode Island	RI
South Carolina	SC

**U.S. States and Abbreviations—Continued**

U.S. state	Abbreviation
South Dakota	SD
Tennessee	TN
Texas	TX
Utah	UT
Vermont	VT
Virginia	VA
Washington	WA
West Virginia	WV
Wisconsin	WI
Wyoming	WY

**CONVERSION RATIOS FOR METRIC-U.S. MEASURES****Metric/U.S. Conversion Factors**

Length	Length
1 mile = 1.609 kilometers	1 kilometer = 0.6214 mile
1 foot = 0.3048 meters	1 meter = 3.281 feet
<b>Area</b>	<b>Area</b>
1 square mile = 2.590 square kilometers	1 square kilometer = 0.3861 square miles
<b>Weight</b>	<b>Weight</b>
1 U.S. short ton = 2,000 pounds =	1 metric ton = 1,000 kilograms =
0.9072 metric tons	1.102 U.S. short tons
1 pound = 453.6 grams	1,000 grams = 1 kilogram = 2.205 pounds
<b>Volume</b>	<b>Volume</b>
1 cubic foot = 0.02832 cubic meters	1 cubic meter = 35.31 cubic feet
1 gallon = 3.785 liters	1 liter = 0.2642 gallons
1 BTU = 1055.056 joules	1,000 joules = 0.9478 BTU

1 mile per gallon = 235.2 liters per 100 kilometers

Other conversion factor: 1 barrel = 42 gallons

## LAND PORT NAMES, CANADIAN-U.S. BORDER

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Canadian province	Border crossing	Canadian port code	U.S. port code	Observations
Alaska	Yukon Territory	<b>Alcan-Beaver Creek</b>	8902	3104	
Alaska	British Columbia	<b>Dalton Cache-Prince Rupert</b> <b>Skagway-Whitehorse-Fraser</b>	8080 8904	3106 3103	
Washington	British Columbia	<b>Point Roberts-Boundary Bay</b> <b>Blaine-Douglas and Pacific Highway</b> Blaine-Douglas Highway  Blaine-Pacific Highway  <b>Lynden-Aldergrove</b> <b>Sumas-Huntington</b>  <b>Nighthawk-Chopaka</b> <b>Oroville-Osoyoos</b> <b>Ferry-Midway</b> <b>Danville-Carson</b> <b>Frontier-Paterson</b> <b>Laurier-Cascade</b> <b>Boundary-Waneta</b> <b>Metaline Falls-Nelway</b>	8161 8133  8131/8132  8174 8171/8173  8320 8191 8330 8161 8360 8162 8400 8340	3017 3004    3023 3009  3011 3019 3013 3012 3020 3016 3015 3025	Passenger vehicles/buses/passengers (Commercial/traffic operations westbound)  Passenger vehicles/buses/passengers (Commercial/traffic operations westbound)  (Commercial/traffic operations westbound)
Idaho	British Columbia	<b>Porthill-Rykerts</b> <b>Eastport-Kingsgate</b>	8370 8181	3308 3302	
Montana	British Columbia	<b>Roosville-Grasmere</b>		3318	
Montana	Alberta	<b>Piegan-Carway</b> <b>Del Bonita-Del Bonita</b>	7053 7055	3316 3322	



## LAND PORT NAMES, CANADIAN-U.S. BORDER—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Canadian province	Border crossing	Canadian port code	U.S. port code	Observations
Montana—Con.	Alberta—Con.	<b>Sweetgrass-Coutts</b> <b>Whitlash-Aden</b>	7051 7052	3310 3321	
Montana	Saskatchewan	<b>Turner-Climax</b> <b>Morgan-Monchy</b> <b>Opheim-West Poplar</b> <b>Scobey-Coronach</b> <b>Whitetail-Big Beaver</b> <b>Raymond-Regway</b>	6014 6015 6013 6012 6011 6070	3306 3319 3317 3309 3312 3301	
North Dakota	Saskatchewan	<b>Fortuna-Oungre</b> <b>Ambrose-Torquay</b> <b>Noonan-Estevan</b> <b>Portal-North Portal</b> <b>Northgate-Northgate</b> <b>Sherwood-Carievale</b>	6100 6103 6102 6021 6023 6024	3417 3410 3420 3403 3406 3414	
North Dakota	Manitoba	<b>Antler-Lyleton</b> <b>Westhope-Coulter</b> <b>Carbury-Goodlands</b> <b>Dunseith-Boissevain</b> <b>St. John-Lena</b> <b>Hansboro-Cartwright</b> <b>Sarles-Crystal City</b> <b>Hannah-Snowflake</b> <b>Maida-Windygate</b> <b>Walhalla-Winkler</b> <b>Neché-Gretna</b> <b>Pembina-Emerson</b>	5083 5081 5082 5071 5073 5072 5091 5092 5093 5031 5030 5021	3413 3419 3421 3422 3405 3415 3409 3408 3416 3407 3404 3401	

# **LAND PORT NAMES, CANADIAN-U.S. BORDER—Continued**

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Canadian province	Border crossing	Canadian port code	U.S. port code	Observations
Minnesota	Manitoba	<b>Noyes-Emerson East</b>	5025	3402	
		<b>Pinecreek-Piney</b>	5051	3425	
		<b>Roseau-South Junction</b>	5053	3426	
		<b>Warroad-Sprague</b>	5052	3423	
Minnesota	Ontario	<b>Baudette-Rainy River</b>	4880	3424	
		<b>International Falls-Ranier-Fort Frances</b>	4780	3604	Pedestrians
		<b>Grand Portage-Pigeon River</b>	4751	3613	
Michigan	Ontario	<b>Sault Ste. Marie-Sault Ste. Marie</b>	4410	3803	
		<b>Port Huron-Sarnia</b>	4401	3802	Passenger vehicles/passengers
		<b>Algonac-Walpole Island</b>	4651	3814	
		<b>Detroit-Windsor</b>	4530/4520	3801	Passenger vehicles/buses/passengers
		Ambassador Bridge-Windsor Ambassador Bridge	4530	3801	Passenger vehicles/buses/passengers
New York	Ontario	Windsor-Detroit Tunnel-Windsor Tunnel	4520	3801	Passenger vehicles/buses/passengers
		<b>Buffalo-Niagara Falls-Fort Erie and Niagara Falls</b>		0901	
		Buffalo-Fort Erie	4102/4101	0901	Passenger vehicles/buses/passengers (commercial)
		Niagara Falls-Niagara Falls		0901	Passenger vehicles/buses/passengers
		Buffalo, Peace Bridge-Fort Erie	4102/4101	0901	(commercial)
		Niagara Falls, Rainbow Bridge-Rainbow Bridge	4272	0901	Passenger vehicles/buses/passengers
		Niagara Falls, Whirlpool Rapids Bridge-Whirlpool Rapids Bridge			
		Lewiston Bridge-Queenston Bridge	4271/4275	0901	Passenger vehicles/buses/passengers (commercial)
		<b>Cape Vincent-Point Alexandria</b>	4273	0901	Passenger vehicles/buses/passengers
		<b>Alexandria Bay-Lansdowne</b>	4560	0706	
		Ogdensburg-Prescott	4390	0708	
				0701	

## LAND PORT NAMES, CANADIAN-U.S. BORDER—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Canadian province	Border crossing	Canadian port code	U.S. port code	Observations
New York	Ontario/Québec	<b>Massena-Cornwall</b>	4090	0704	
New York	Québec	<b>Fort Covington-Dundee</b> <b>Trout River-Trout River and Jamieson</b> Trout River-Trout River Trout River-Jamieson <b>Châteaugay-Herdman</b> <b>Champlain-Rouses Point-Lacolle</b> <b>Routes (15, 221, 223) and Covey Hill</b> Champlain-Rouses Point-Lacolle (Route 15) Champlain-Rouses Point-Lacolle (Route 221) Champlain-Rouses Point-Lacolle (Route 223) Champlain-Rouses Point-Covey Hill	3300  3520 3720 3020  3513  3512 3511 3332	0705 0715 0715 0715 0711 0712  0712 0712 0712 0712	
Vermont	Québec	<b>Highgate Springs-Alburg-Phillipsburg-Noyan</b> <b>Richford-Abercorn and East Pinnacle</b> Richford-Abercorn Richford-East Pinnacle North Troy-Highwater <b>Derby Line-Rock Island (Routes 55 and 143)</b> Derby Line-Rock Island (Route 55) Derby Line-Rock Island (Route 143) <b>Norton-Stanhope</b> <b>Beecher Falls-East Hereford</b>	3370  0203 3180 3690 3340  3141 3142 3540 3620	0212  0203 0203  0209  0209 0209 0211 0206	    Rail crossing

# **LAND PORT NAMES, CANADIAN-U.S. BORDER**—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Canadian province	Border crossing	Canadian port code	U.S. port code	Observations
Maine	Québec	<b>Jackman-Armstrong</b> Skinner-Boundary	3291	0104	Rail crossing
Maine	New Brunswick	<b>Fort Kent-Clair</b> <b>Madawaska-Edmundston</b> <b>Van Buren-St. Leonard</b> <b>Limestone-Gillespie</b> <b>Fort Fairfield-Andover</b> <b>Bridgewater-Centreville</b> <b>Houlton-Woodstock Road</b> <b>Vanceboro-St. Croix</b> <b>Calais-St. Stephen</b>	2160 2130 2180 2370 2140 2150 2121 2310 2110	0110 0109 0108 0118 0107 0127 0106 0105 0115	
Maine	Nova Scotia	<b>Portland, Bar Harbour-Yarmouth</b> Bar Harbour-Yarmouth Portland-Yarmouth	7750 7750	0101	Ferry crossing Pedestrians Pedestrians



## LAND PORT NAMES, MEXICAN-U.S. BORDER

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Mexican state	Border crossing	U.S. port code	Observations
California	Baja California	<b>San Ysidro-Puerta México (Tijuana)</b>	2504	Passenger vehicles/rail/pedestrian
		<b>Otay Mesa-Mesa de Otay</b>	2506	Primarily freight
		<b>Tecate-Tecate</b>	2505	Includes rail
		<b>Calexico-Mexicali</b> Calexico-Mexicali I	2503	Includes rail
		<b>Calexico East-Nuevo Mexicali</b> <b>Andrade-Vicente Guerrero</b> Andrade-Los Algodones	2507 2502	Completed 1997
Arizona	Sonora	<b>San Luis-San Luis Río Colorado</b>	2608	
		<b>Lukeville-Sonoyta</b>	2602	
		<b>Sasabe-Sasabe</b>	2606	Also known as La Garita de Landrillera
		<b>Nogales-Nogales</b> Nogales (DDC)-Nogales I Nogales I (Morley Gate)-Nogales II Nogales (Mariposa)-Nogales III	2604	Includes rail Passenger vehicles/pedestrian only
		<b>Naco-Naco</b> <b>Douglas-Agua Prieta</b>	2603 2601	Passenger vehicles/freight only
New Mexico	Chihuahua	<b>Columbus-Gral.</b> Rodrigo M. Queredo	2406	Mainly passenger
		Antelope Wells-El Berrendo	2406	Trade data included in Columbus, NM
		<b>Santa Teresa-San Jerónimo</b>	2408	Passenger vehicles and freight
Texas	Chihuahua	<b>El Paso-Ciudad Juárez</b> Paso del Norte (Santa Fe Street)-Puente Benito Juárez Good Neighbor Bridge-Buen Vecino Bridge	2402	One-way northbound toll, includes rail Also known as Stanton Street Bridge, Friendship Bridge, Puente Río Bravo, Puente Ciudad Juárez-Stanton Lerdo, Puente Lerdo.

# **LAND PORT NAMES, MEXICAN-U.S. BORDER**—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Mexican state	Border crossing	U.S. port code	Observations
Texas	Chihuahua—Con.	Bridge of the Americas-Puente Internacional Córdova-Las Américas	2404	Also known as Puente Río Bravo, Puente Córdova Bridge, Puente Libre, BOTA. Load limits includes rail, no tolls
		Ysleta-Zaragoza Bridge		Includes rail
		<b>Fabens-Guadalupe Bravos</b>		Also known as Puente la Caseta. Toll (northbound)
		Fabens-Caseta-Poctor P. Parra		Mainly passenger. Trade data included in Fabens, Texas
		<b>Fort Hancock-El Porvenir</b>		Passenger vehicles/pedestrians. Toll (northbound)
Texas	Coahuila	Fort Hancock-El Porvenir Bridge	2403	Includes rail
		<b>Presidio-Ojinaga</b>		
		Presidio-Ojinaga Bridge		
		<b>Del Río-Ciudad Acuña</b>		
		La Linda Bridge-Puente la Linda		Also known as Big Bend Crossing Bridge, Heath Crossing. Two-lane facility with little traffic
		Del Río, Lake Amistad Dam Crossing-Presa La Amistad		
		Del Río-Ciudad Acuña International Bridge		Also known as Del Río International Bridge, Puente Acuña-Ciudad Del Río.
		<b>Eagle Pass-Piedras Negras</b>		
		Eagle Pass Bridge-Piedras Negras I		Also known as Eagle Pass-Piedras Negras International Bridge.
		Eagle Pass Bridge-Piedras Negras II		Passenger vehicles/pedestrians/commercial vehicles
Texas	Nuevo León	Eagle Pass Rail Crossing -Piedras Negras Rail Crossing	2304	Rail only
		<b>Laredo-Colombia</b>		Also known as Laredo III, Colombia Bridge, Puente Solidaridad, Puente Colombia. Passenger vehicles/pedestrians/commercial vehicles

## LAND PORT NAMES, MEXICAN-U.S. BORDER—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Mexican state	Border crossing	U.S. port code	Observations
Texas	Tamaulipas	<b>Laredo-Nuevo Laredo</b>	2304	Rail only
		Laredo-Nuevo Laredo Railroad Crossing		Also known as Convent Street Bridge, Laredo International Bridge, Old Bridge, Laredo-Nuevo Laredo Bridge I, Puente Nuevo Laredo, Puente Laredo I, Puente Viejo.
		Gateway to the Americas Bridge-Nuevo Laredo I		(Note: Beginning in April 2000, bridges #1 and #2 only service passenger traffic because of the opening of bridge #4, World Trade Bridge.)
		Juarez-Lincoln Bridge-Nuevo Laredo II		Also known as bridge #2, Laredo-Nuevo Laredo Bridge 2, Puente Juarez Lincoln.
		Falcon Heights-Nuevo Ciudad Guerrero		(Note: Beginning in April 2000, bridges #1 and #2 only service passenger traffic because of the opening of bridge #4, World Trade Bridge.)
		Lake Falcon Dam Crossing-Puente San Juan	2310	Also known as Falcon Dam, Presa Falcon, Puente Internacional de la Presa.
		World Trade Bridge		Primarily passenger vehicles
		<b>Roma-Ciudad Miguel Alemán</b>		Also known as bridge #4. Opened in April 2000 for commercial truck traffic. Beginning the same time, bridges #1 and #2 only service passenger traffic.
		Roma-Ciudad Miguel Alemán Bridge		Also known as Starr County International Bridge, Roma Bridge, Puente Roma-Miguel.
		<b>Rio Grande City-Ciudad Camargo</b>		Also known as Starr-Camargo Bridge, Puente Camargo.
		Rio Grande City-Camargo Bridge	2307	Narrow two-lane bridge. Primarily passenger vehicles
		Los Ebanos-Gustavo Díaz Ordaz		Passenger ferry. The construction of Los Ebanos International Bridge is proposed as an alternative for this ferry.

# LAND PORT NAMES, MEXICAN-U.S. BORDER—Continued

(In geographic order from West to East Coast. Bold font indicates the name of the Customs port. Regular indented font indicates physical border crossings associated with each Customs port)

U.S. state	Mexican state	Border crossing	U.S. port code	Observations
Texas—Con.	Tamaulipas—Con.	<b>Hidalgo-Reynosa</b> Mc Allen-Hidalgo-Reynosa Bridge	2305	Also known as Hidalgo Bridge, Puente Reynosa, Puente Reynosa-McAllen I. Two structures. The old four-lane bridge serves only southbound traffic. The new four-lane bridge serves only northbound traffic. Passenger vehicles/freight
		Pharr-Reynosa III International Bridge on the Rise <b>Progreso-Nuevo Progreso</b> Progreso International Bridge-Nuevo Progreso <b>Brownsville-Matamoros</b> Free Trade Bridge-Puente Internacional Libre Comercio B&M Bridge	2309 2301	Also Known as B&P Bridge, Puente Las Flores, Puente Internacional Nuevo Progreso-Progreso.  Also known as Indios-Lucio Blanco Bridge, Puente Lucio Blanco-Los Indios. Also known as Brownsville I & Matamoros Bridge, B Y M, Puente Viejo. Passenger vehicles/freight/includes rail Also known as El Puente, Puente Nuevo, Brownsville II. Also known as Los Tomates Bridge, Expressway 77 Bridge, and Matamoros III Bridge.
		Gateway International Bridge-Puerta México The Veterans-General Ignacio Zaragoza		



# HARMONIZED TARIFF SCHEDULE FOR INTERNATIONAL MERCHANDISE TRADE

## Chapter Description

1	Live Animals
2	Meat and Edible Offal
3	Fish and Crustaceans
4	Dairy Products
5	Products of Animal Origin
6	Live Trees and Plants
7	Edible Vegetables and Roots
8	Edible Fruit and Nuts
9	Coffee, Tea and Spices
10	Cereals
11	Malts, Starches and Inulin
12	Oil Seeds and Oleaginous Fruits
13	Lac, Gums, Resins and Saps
14	Vegetable Plaiting Materials
15	Animal or Vegetable Fats and Oils
16	Preparations of Fish and Meat
17	Sugars and Sugar Confectionery
18	Cocoa and Cocoa Preparations
19	Preparations of Cereals and Flour
20	Preparations of Vegetables, Fruits and Nuts
21	Miscellaneous Edible Preparations
22	Beverages, Spirits and Vinegar
23	Food Residues and Waste
24	Tobacco and Manufactured Tobacco
25	Salt, Sulfur, Plaster and Cement
26	Ores, Slag and Ash
27	Mineral Fuels, Oils and Waxes
28	Inorganic Chemicals
29	Organic Chemicals
30	Pharmaceutical Products
31	Fertilizers
32	Tanning or Dyeing Extracts
33	Essential Oils and Resinoids
34	Soap and Organic Surface-Active Agents
35	Albuminoidal Substances, Glues and Enzymes

## Chapter Description

36	Explosives
37	Photographic Goods
38	Miscellaneous Chemical Products
39	Plastics
40	Rubber and Articles
41	Raw Hides and Skins
42	Articles of Leather and Handbags
43	Furskins and Artificial Fur
44	Wood and Articles
45	Cork and Articles
46	Straw and Basketware
47	Pulp of Wood and Paperboard
48	Paper and Paperboard
49	Printed Books
50	Silk
51	Wool and Animal Hair
52	Cotton
53	Other Vegetable Fibers and Paper Yarn
54	Man-made Filaments
55	Man-made Staple Fibers
56	Wadding, Felt and Nonwovens
57	Carpets and Other Textile Floor Coverings
58	Special Woven Fabrics
59	Impregnated Fabrics
60	Knitted or Crocheted Fabrics
61	Knitted or Crocheted Apparel
62	Not Knitted or Crocheted Apparel
63	Other Made up Textile Articles
64	Footwear
65	Headgear
66	Umbrellas and Walking Sticks
67	Feathers and Down
68	Stone, Plaster, Cement and Asbestos
69	Ceramic Products
70	Glass

Chapter	Description	Chapter	Description
71	Pearls, Stones, Metals and Imitation Jewelry	86	Locomotives and Traffic Signals
72	Iron and Steel	87	Vehicles Other than Railway
73	Articles of Iron and Steel	88	Aircraft, Spacecraft and Parts
74	Copper and Articles	89	Ships and Boats
75	Nickel and Articles	90	Measuring and Testing Instruments
76	Aluminum and Articles	91	Clocks, Watches and Parts
78	Lead and Articles	92	Musical Instruments and Parts
79	Zinc and Articles	93	Arms and Ammunition and Parts
80	Tin and Articles	94	Furniture, Lamps and Prefabricated Buildings
81	Other Base Metals and Cermets	95	Toys, Games and Sport Equipment
82	Tools of Base Metal	96	Miscellaneous Manufactured Articles
83	Miscellaneous Articles of Base Metals	97	Works of Art and Antiques
84	Nuclear Reactors, Boilers, Machinery and Parts	98	Special Classification Provisions
85	Electrical Machinery, Equipment and Parts	99	Special Trade Transactions

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a p p e n d i x

D

# Tables in U.S. Measures





# appendix D

## Tables in U.S. Measures

### table 1-2

#### Area

(Number of square miles)

	Canada	Mexico	United States
<b>Total area</b>	<b>3,849,674</b>	<b>839,145</b>	<b>3,717,813</b>
Land area	3,558,097	756,470	3,536,294
Water area	291,577	82,675	181,519

#### SOURCES

##### Canada

Natural Resources Canada. GeoAccess Division. (Ottawa, Ont.: 1998).

##### Mexico

Instituto Nacional de Estadística, Geografía e Informática. Dirección General de Geografía. (Aguascalientes, Ags.: 1998).

##### United States

U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States 1998*. (Washington, DC: 1998).

table 3-3

## Motor Vehicle Fatality and Injury Rates

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
Road motor vehicle fatalities, total	3,963	3,351	3,091	10,201	9,043	9,305	44,599	41,817	42,065
Road motor vehicle injuries, total	262,680	241,935	230,890	93,325	121,638	115,274	3,231,000	3,465,000	3,511,000
Road vehicle-miles, total (billions)	N	<sup>e</sup> 197.0	N	N	N	N	2,144	2,423	2,482
Road motor vehicles, total (millions)	17.0	<sup>r</sup> 17.0	<sup>r</sup> 17.2	10.2	12.0	12.4	193.1	205.4	210.2
<b>Rates per 100 million vehicle-miles</b>									
Fatality	N	<sup>e</sup> 1.7	N	N	N	N	2.1	1.7	1.7
Injury	N	123	N	N	N	N	151	143	141
<b>Rates per 10,000 road motor vehicles</b>									
Fatality	2.3	2.0	1.8	10.0	7.5	7.5	2.3	2.0	2.0
Injury	155	142	134	91	101	93	167	169	167

KEY: e = Data are estimated. N = Data are nonexistent. r = Data are revised.

## SOURCES

## Canada

Road vehicle-kilometers: Transport Canada. Minister of Public Works and Government Services. *Transportation in Canada 1997—Annual Report*. (Ottawa, Ont.: 1998).

Road motor vehicles: Statistics Canada. *Road Motor Vehicles Registrations, Catalogue No. 53-219-XPB*. (Ottawa, Ont.: various years).

Road fatalities and injuries: Transport Canada. Road Safety and Motor Vehicle Regulation. *Traffic Accident Information Database*. Special tabulation. (Ottawa, Ont.: 1998).

## Mexico

Road motor vehicles: Instituto Nacional de Estadística, Geografía e Informática based on figures from Departamento del Distrito Federal, Dirección General de Autotransporte Urbano; state finance office and state police and traffic offices. (Mexico City, D.F.: various years).

Road fatalities and injuries: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad or their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

Secretaría de Comunicaciones y Transportes. Dirección General de Policía Federal de Caminos y Puertos. (Mexico City, D.F.: various years).

## United States

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998* and *National Transportation Statistics 1999*. (Washington, DC: 1998 and 1999).

**t a b l e 4-1**

# Energy Consumption by the Transportation Sector

Quads (quadrillion Btu)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Energy consumption, total<sup>a</sup></b>	<b>7.43</b>	<b>8.14</b>	<b>8.51</b>	<b>4.89</b>	<b>5.20</b>	<b>5.59</b>	<b>84.12</b>	<b>90.86</b>	<b>93.87</b>
<b>Transportation consumption, total<sup>b</sup></b>	<b>1.93</b>	<b>2.15</b>	<b>2.20</b>	<b>1.21</b>	<b>1.33</b>	<b>1.36</b>	<b>22.54</b>	<b>24.07</b>	<b>24.66</b>
Transportation's share of total energy consumption (percent)	26.0	26.4	25.9	24.8	25.5	24.4	26.8	26.5	26.3
Fossil fuels, total <sup>c</sup>	1.92	2.14	2.19	N	N	N	22.49	24.03	24.62
Natural gas	0.13	0.23	0.24	N	N	N	0.68	0.72	0.73
Trillion cubic feet	0.12	0.22	0.23	N	N	N	0.66	0.70	0.71
Petroleum	1.79	1.91	1.95	1.20	1.33	1.36	21.81	23.31	23.89
Million barrels	329	351	359	211	243	249	4,004	4,281	4,385
Electricity <sup>b</sup>	<sup>b</sup> 0.011	0.013	0.013	0.003	0.003	0.004	0.014	0.013	0.013

<sup>a</sup>For all three countries, energy consumption, total **includes** electrical system energy losses.

<sup>b</sup>For all three countries, transportation consumption, total and electricity do **not** include electrical system energy losses.

<sup>c</sup>Coal is not included in this table, because all three countries use negligible amounts of coal for transportation.

**KEY:** N = Data are nonexistent.

## NOTES

### Canada

Energy consumption, total: Includes renewable energy.

Transportation consumption, total: Includes fuel used in fisheries and in private trucking, but excludes fuel consumption by public administrations.

### Mexico

Natural gas: Data are nonexistent, but natural gas consumption in Mexico is estimated to be quite small.

### United States

Energy consumption, total: Includes renewable energy.

Transportation consumption, total: Total is greater than the sum of the components, because electrical system energy losses are not listed. Fisheries are not included, but fuel consumption by public administrations is included.

## SOURCES

### Canada

Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue No. 57-003-XPB*. (Ottawa, Ont.: various editions).

### Mexico

Secretaría de Energía. *Balance Nacional, Energía. 1996*. (Mexico City, D.F.: 1998).

### United States

U.S. Department of Energy. Energy Information Agency. *Annual Energy Review, 1997* and *Monthly Energy Review, August 1998*. (Washington, DC: 1998).

**table 4-2**

# Energy Consumption by Mode of Transportation

Trillion Btu (10 to the 12th Btu)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total</b>	<b>1,931.4</b>	<b>2,150.7</b>	<b>2,203.8</b>	<b>1,208.8</b>	<b>1,326.1</b>	<b>1,360.3</b>	<b>22,540</b>	<b>24,070</b>	<b>24,660</b>
<b>Air</b>	<b>175.5</b>	<b>175.4</b>	<b>195.1</b>	<b>69.8</b>	<b>90.4</b>	<b>88.5</b>	<b>1,811</b>	<b>1,836</b>	<b>1,891</b>
Jet fuel	170.3	171.5	191.3	68.1	86.8	87.4	1,769	1,803	1,857
Aviation gasoline	5.2	3.9	3.7	1.6	3.7	1.1	42	33	34
<b>Road</b>	<b>1,416.4</b>	<b>1,546.2</b>	<b>1,574.3</b>	<b>1,087.1</b>	<b>1,188.1</b>	<b>1,221.8</b>	<b>N</b>	<b>18,268</b>	<b>18,726</b>
Gasoline	1,114.6	1,150.4	1,165.3	794.2	880.4	895.1	13,691	14,633	14,939
Diesel	277.2	364.4	376.7	278.5	290.0	308.5	2,900	3,600	3,750
Other fuels	24.6	31.4	32.4	14.4	17.6	18.2	N	35	37
<b>Pipeline</b>	<b>135.0</b>	<b>232.5</b>	<b>241.2</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>680</b>	<b>722</b>	<b>734</b>
Natural gas	126.1	220.7	228.9	U	U	U	680	722	734
Electricity	8.2	10.4	10.2	U	U	U	U	U	U
Diesel	0.6	1.3	2.1	U	U	U	U	U	U
<b>Rail</b>	<b>84.8</b>	<b>76.7</b>	<b>75.0</b>	<b>25.2</b>	<b>21.4</b>	<b>23.4</b>	<b>444</b>	<b>493</b>	<b>507</b>
Distillate/diesel fuel	84.8	76.7	75.0	25.2	21.4	23.4	443	492	506
Freight rail	82.6	74.7	73.0	U	U	U	432	483	496
Intercity passenger	2.2	2.0	2.0	U	U	U	11	9	10
Electricity									
Intercity passenger	NS	NS	NS	U	U	U	1	1	1
<b>Transit</b>	<b>18.0</b>	<b>23.3</b>	<b>22.3</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>121</b>	<b>119</b>
Electricity	3.0	2.8	2.9	2.6	3.3	3.4	17	17	17
Motor fuels									
Gasoline	0.5	0.4	NS	N	N	N	4	8	8
Diesel	12.1	12.7	12.0	N	N	N	90	94	92
Compressed natural gas	2.5	7.4	7.4	N	N	N	N	2	2
<b>Water transport</b>	<b>101.7</b>	<b>96.7</b>	<b>96.0</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>1,396</b>	<b>1,338</b>	<b>1,323</b>
Residual fuel oil	57.0	52.8	52.4	19.6	1.3	1.5	947	881	853
Distillate/diesel fuel oil	44.7	43.1	43.0	4.5	21.5	21.7	286	324	346
Gasoline	NS	0.8	0.6	N	N	N	163	133	124

**KEY:** N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

## NOTES

### All Countries

Transportation energy consumption: Electrical systems energy losses are excluded from the overall total as well as individual modal totals.

Transit: Canadian and U.S. data refer to **all transit**, including local transit buses and other road transit vehicles, which also are reported under road. Some ferryboats also are included.

### Mexico

Road, other fuels: Refers to liquified petroleum gas.

Road, gasoline, diesel, other fuels: Includes data on transit, motor fuels, and no breakdown is possible.

Rail, distillate/diesel fuel: Includes passenger and cargo services, and no breakdown is possible.

Transit, motor fuels: Data for subcategories cannot be separately identified for transit. Instead they are included in the fuel categories for road (gasoline, diesel and other fuels).

Water transport, residual fuel oil, distillate/diesel fuel oil: In 1991, vessel fuel usage began to change. Diesel substituted for residual fuel oil.

### United States

Total: The total differs from the sum of the individual modes for reasons discussed in Appendix B.



## Energy Consumption by Mode of Transportation—Continued

## SOURCES

## Canada

All modes except transit rail: Statistics Canada. *Quarterly Report on Energy Supply-Demand in Canada, Catalogue No. 57-003-XPB*. (Ottawa, Ont.: various quarterly editions).

Natural Resources Canada. *Canada's Energy Outlook 1996-2020*. (Ottawa, Ont.: 1998).

Transit rail: Statistics Canada. *Passenger Bus and Urban Transit Statistics, Catalogue No. 53-215-XPB*. (Ottawa, Ont.: various years).

## Mexico

Secretaría de Energía. *Balance Nacional, Energía. 1996*. (Mexico City, D.F.: 1998).

Comisión Nacional para el Ahorro de Energía. Private communication. (Mexico City, D.F.: 1998).

## United States

Total: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998).

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Aviation Administration. *General Aviation and Avionics Survey*. (Washington, DC: various years).

Road: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997).

Pipeline: U.S. Department of Energy. *Natural Gas Annual 1996*. (Washington, DC: 1997).

Rail: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997).

National Railroad Passenger Corp. State and Local Affairs Department. Private Communication. (Washington, DC: 1998).

National Railroad Passenger Corp. Director of Fuel Management. Private Communication. (Washington, DC: 1998).

American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

American Public Transit Association. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Energy. Energy Information Administration. *Fuel Oil and Kerosene Sales*. (Washington, DC: various years).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

**table 4-3**

# Estimated Consumption of Alternative and Replacement Fuels for Road Motor Vehicles

(Thousand gasoline-equivalent gallons)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1992 <sup>a3</sup>	1995	1996
<b>Fuel consumption, total<sup>a</sup></b>	<b>11,180,864</b>	<b>12,198,778</b>	<b>12,415,527</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>134,231,000</b>	<b>144,776,000</b>	<b>148,182,000</b>
<b>Alternative fuels, total</b>	<b>217,776</b>	<b>311,582</b>	<b>319,844</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>229,631</b>	<b>277,507</b>	<b>297,231</b>
Liquefied petroleum gases (LPG)	197,664	252,244	260,277	N	N	N	208,142	232,701	239,158
Compressed natural gas (CNG)	20,106	59,259	59,488	N	N	N	16,823	35,162	46,923
Liquefied natural gas (LNG)	0	0	0	N	N	N	585	2,759	3,247
Methanol, 85 percent (M85)	5	80	80	N	N	N	1,069	2,887	3,390
Methanol, neat (M100)	0	0	0	N	N	N	2,547	2,150	347
Ethanol, 85 percent (E85)	0	0	0	N	N	N	21	190	694
Ethanol, 95 percent (E95)	0	0	0	N	N	N	85	995	2,699
<b>Electricity</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>359</b>	<b>663</b>	<b>773</b>
Oxygenates									
Methyl tertiary butyl ether (MTBE)	NS	NS	NS	N	N	N	1,175,000	2,691,200	2,749,700
Ethanol in gasohol	2,600	10,600	10,600	N	N	N	701,000	910,700	660,200
<b>Traditional fuels</b>									
Gasoline	8,962,970	9,250,671	9,370,584	N	N	N	110,135,000	115,943,000	117,783,000
Diesel	1,997,477	2,625,957	2,714,531	N	N	N	23,866,000	28,555,040	30,101,430

<sup>a</sup>U.S. data for 1990 are not available. Nearest data year is 1992.

**KEY:** N = Data are nonexistent. NS = Not significant.

## NOTES

### Mexico

Alternative fuels, liquefied petroleum gases: In Table 4-2 under road, other fuels, an estimation of fuel consumption in petajoules is shown.

## SOURCES

### Canada

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

### United States

U.S. Department of Energy. Energy Information Administration. *Alternatives to Traditional Transportation Fuels, 1996*. (Washington, DC: 1997).

**table 4-4****Average Price<sup>a</sup> of Fossil Fuel to End-Users**

(Current U.S. cents per gallon)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Motor vehicle fuel</b>									
<b>Gasoline</b>									
Leaded	NA	NA	NA	95.5	127.3	139.4	114.9	NA	NA
Unleaded premium	204.4	178.7	186.8	NA	NA	158.4	134.9	133.6	141.3
Unleaded regular	189.5	152.8	161.0	134.6	132.1	143.4	116.4	114.7	123.1
Average over all types									
Price with taxes	U	U	U	U	U	U	121.7	120.5	128.8
Taxes	74.3	73.6	75.3	U	U	U	24.6	36.9	37.0
<b>Diesel</b>									
Price with taxes	163.2	116.4	119.9	81.4	96.7	106.6	U	110.9	123.5
Taxes	58.1	46.3	46.6	U	U	U	31.1	43.4	43.3
<b>Aviation fuel</b>									
Gasoline	159.4	118.4	119.7	134.6	132.1	143.4	112.0	100.5	111.6
Jet fuel	83.5	53.3	58.4	95.3	67.4	88.6	76.7	54.6	64.8
<b>Rail fuel</b>									
Diesel	89.0	59.3	64.8	81.4	96.7	106.6	69.2	60.0	67.7
<b>Water transport</b>									
Combined fuels	54.4	38.1	43.8	30.7	24.8	49.8	U	38	42

<sup>a</sup>Unless otherwise stated in the country notes below, prices include the cost of the fuel and taxes. Taxes are given separately in this table only for all types of motor vehicle gasoline and for motor vehicle diesel fuel. See Appendix B for information on fuel taxes in each country.

**KEY:** NA = Not applicable. U = Data are unavailable.

**NOTES****Mexico**

Data refer to sales price to the public as of December 31 of each year.

**United States**

Motor vehicle fuel taxes: Sales weighted average of federal and state fuel taxes only. Does not include state sales taxes. If these were included, they would raise the average tax in 1996 by roughly half a cent per liter for both gasoline and diesel. Note that the motor vehicle fuel prices do include state sales taxes.

Aviation fuel: Does not include any taxes. Price of jet fuel is that paid by the large certified air carriers, which are defined in Appendix B.

Rail fuel: Price includes federal fuel taxes only; no state taxes are included.

# Average Price<sup>a</sup> of Fossil Fuel to End-Users—Continued

## SOURCES

### Canada

Natural Resources Canada. Office of Energy Efficiency. (Ottawa, Ont.: 1998).

### Mexico

Petróleos Mexicanos. PEMEX-Refinación. *Anuario Estadístico, 1998*. (Mexico City, D.F.: 1999).

Petróleos Mexicanos. PEMEX-Refinación. Subgerencia de Planeación (Mexico City, D.F.:1999)

### United States

Motor vehicle fuel: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review 1997*. (Washington, DC: 1998).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

Aviation fuel, gasoline: U.S. Department of Energy. Energy Information Administration. *Annual Energy Review, 1997*. (Washington, DC: 1998).

Aviation fuel, jet fuel: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. Private Communication. (Washington, DC: 1998).

Rail fuel: Association of American Railroads. *Railroad Facts, 1997 Edition*. (Washington, DC: 1997).

Rail fuel taxes: Association of American Railroads. Private Communication. (Washington, DC: 1998).

Water transport: U.S. Department of Transportation. Maritime Administration (MARAD). Private Communication. (Washington, DC: 1998).



# New Model Year Fuel Efficiency for Road Motor Vehicles

(Gallons per 100 miles)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Sales weighted average</b>									
Passenger cars	3.5	3.4	3.4	3.9	3.4	3.3	3.6	3.5	3.5
Light trucks	4.8	4.9	4.8	U	U	U	4.8	4.9	4.8
<b>Range</b>									
Passenger cars	8.8 to 2.1	8.2 to 2.1	7.6 to 2.1	U	3.9 to 2.9	4.6 to 2.7	11.5 to 1.5	9.7 to 1.7	7.2 to 1.8
Light trucks	9.5 to 2.9	8.0 to 3.6	7.7 to 3.6	U	U	U	8.4 to 3.0	6.8 to 3.0	7.1 to 3.2

**KEY:** U = Data are unavailable.

## NOTES

### All Countries

Sales weighted average: Assumes 55 percent city and 45 percent highway travel.

Light trucks: Gross vehicle weight rating of zero kg to 3,856 kg (i.e., 8,500 pounds or less).

Averages and ranges: United States and Canada include both domestic and imported vehicles. Mexico includes only domestic vehicles.

## SOURCES

### Canada

Sales weighted average: Transport Canada. *Transportation in Canada, 1997 - Annual Report, TP 13198*. (Ottawa, Ont.: 1998).

Ranges: Natural Resources Canada. *Canada's Energy Outlook, 1996-2020*. (Ottawa, Ont.: 1997).

Transport Canada and Natural Resources Canada. *Fuel Consumption Guide, Annual*. (Ottawa, Ont.: various years).

### Mexico

Secretaría de Energía. Comisión Nacional para el Ahorro de Energía, Dirección de Transporte. (Mexico City, D.F.: 1998).

### United States

Sales weighted average: U.S. Department of Transportation. National Highway Traffic Safety Administration. Consumer Programs Division, NPS-32. (Washington, DC: 1998).

Ranges: U.S. Department of Transportation. National Highway Traffic Safety Administration. Automotive Fuel Economy Program. *Twenty-second Annual Report to Congress*. (Washington, DC: various years).

U.S. Department of Transportation. National Highway Traffic Safety Administration. Consumer Programs Division, NPS-32. Private Communication. (Washington, DC: 1998).

table 4-6a

# Federal Emission Control Requirements for Passenger Cars and Light Trucks: Model Year

(Grams of emissions per mile)

	Total hydrocarbons	Nonmethane hydrocarbons	Carbon monoxide (CO)	Cold temperature CO	Nitrogen oxides	Particulates
<b>Canada, 1996</b>						
Passenger cars	0.41	NA	3.4	NA	1.0	<sup>a</sup> 0.20
Light trucks						
Under 3,751 pounds (loaded vehicle weight)	0.80	NA	10	NA	1.2	<sup>a</sup> 0.26
Over 3,750 pounds (loaded vehicle weight)	0.80	NA	10	NA	1.7	<sup>a</sup> 0.13
<b>Mexico, model years 1995 and later</b>						
Passenger cars	0.41	NA	3.4	NA	1.0	NA
Light trucks	1.01	NA	14.1	NA	2.3	NA
Under 8,503 pounds (gross vehicle weight)						
<b>United States, model years 1994 and later</b>						
Passenger cars						
Intermediate useful life	0.41	0.25	3.4	10.0	0.4	0.08
Full useful life	NA	0.31	4.2	NA	0.6	0.10
Light trucks						
3,751 to 5,750 pounds (loaded vehicle weight)						
Intermediate useful life	NA	0.32	4.4	10.0	0.7	<sup>b</sup> 0.08
Full useful life	0.80	0.40	5.5	NA	0.97	<sup>b</sup> 0.10

<sup>a</sup>Applies to diesel-fueled vehicles only.

<sup>b</sup>Phase-in begins with model-year 1995.

**KEY:** NA = Not applicable.

## NOTES

### All Countries

Light trucks are vehicles of about 3,856 kg or less gross vehicle weight rating (GVWR). For the United States and Canada, the exact definition is 8,500 pounds or less, and, for the time period of this table, there are four and two categories of light trucks, respectively, within the range of zero through 8,500 pounds.

### Canada

Loaded vehicle weight (LVW): See Appendix B under the United States for definition.

From September 1, 1997, Canadian standards are harmonized with U.S. standards by regulation, for all classes of on-road vehicles.

Passenger cars and light trucks: For cars (light-duty vehicles) and light trucks (light-duty trucks, LDT), Canadian 1996 regulated standards were technically equivalent to those of the United States for 1988 model year vehicles, but in practice, manufacturers and importers provided vehicles meeting U.S. 1996 standards.

### Mexico

Particulates: No regulations are in effect for particulates for these vehicles.

### United States

Useful life: The life over which the standards must be met. See Appendix B for a more complete definition.

Coverage: This table is a simplification of the U.S. emissions standards for passenger cars and light trucks.

Implementation schedules: Schedules are summarized in Appendix B. The standards were phased in over several years.

Passenger cars and light trucks: Data are for gasoline fueled vehicles only. See Appendix B for the differences for diesel fueled vehicles.

Light trucks: There are four categories of light trucks. The regulations presented here are for the LDT2 category, which has a GVWR up to 2,722 kg (ie., 6,000 pounds or less) and a LVW of 1701 kg to 2,608 kg (ie., 3,751 pounds through 5,750 pounds). (GVWR and LVR are defined in Appendix B.) In 1996, LDT2s accounted for more than 60 percent of the sales of new light trucks.

Federal Emission Control Requirements for Passenger  
Cars and Light Trucks: Model Year—*Continued*

SOURCES

Canada

Transport Canada. Road Safety and Motor Vehicle Regulations Directorate. (Ottawa, Ont.: 1998).

Mexico

Instituto Nacional de Ecología. *Diario Oficial de la Federación. Norma Oficial Mexicana NOM-042-ECOL-1993.* (Mexico City, D.F.: 1993).

United States

*U.S. Code of Federal Regulations.* (Washington, DC: 1998).

U.S. Environmental Protection Agency. Office of Air and Radiation. *Mobile Source Emissions Standards Summary.* (Washington, DC: 1992).

U.S. Environmental Protection Agency. Office of Air and Radiation. Office of Mobile Sources, Vehicle Programs and Compliance Division. *Tier 2 Study White Paper.* (Washington, DC: 1997).

**table 5-1**

# Domestic Freight Activity by Mode

(Millions of U.S. short tons)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total</b>	<b>687.1</b>	<b>784.6</b>	<b>809.8</b>	<b>419.0</b>	<b>473.2</b>	<b>490.8</b>	<b>6,701.3</b>	<b>7,784.5</b>	<b>8,069.7</b>
<b>Air</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>8.5</b>	<b>9.4</b>	<b>10.7</b>
<b>Water transport</b>	<b>66.6</b>	<b>55.7</b>	<b>53.8</b>	<b>33.7</b>	<b>35.1</b>	<b>34.8</b>	<b>1,117.8</b>	<b>1,086.2</b>	<b>1,093.3</b>
Coastal shipping	28.9	24.9	23.3	33.7	35.1	34.8	298.6	266.6	267.4
Great Lakes	11.7	8.5	9.7	NA	NA	NA	110.2	116.1	114.9
Inland waterways <sup>a</sup>	26.0	22.3	20.8	NA	NA	NA	709.0	703.4	711.1
<b>Pipeline</b>	<b>244.1</b>	<b>320.3</b>	<b>334.6</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>1,561.1</b>	<b>1,710.3</b>	<b>1,776.7</b>
Crude oil and petroleum products	160.7	192.4	202.2	U	U	U	1,057.0	1,121.0	1,177.0
Natural gas	83.3	128.0	132.4	U	U	U	504.1	589.3	599.7
<b>Rail</b>	<b>211.4</b>	<b>224.8</b>	<b>220.5</b>	<b>38.3</b>	<b>33.8</b>	<b>33.3</b>	<b>1,424.9</b>	<b>1,549.6</b>	<b>1,610.9</b>
<b>Road</b>	<b>164.6</b>	<b>184.4</b>	<b>200.5</b>	<b>346.9</b>	<b>404.2</b>	<b>422.5</b>	<b>2,589.0</b>	<b>3,429.0</b>	<b>3,578.0</b>

<sup>a</sup>Commercially navigable.

**KEY:** NA = Not applicable. U = Data are unavailable.

## NOTES

### Canada

Road: Includes *only* activity of Canadian domiciled for-hire carriers with annual intercity revenues greater than or equal to 1 million Canadian dollars; excludes local (less than 24 kilometers) deliveries and deliveries made by private trucks and small for-hire carriers.

Pipeline: Data are for both oil pipelines and natural gas.

### Mexico

Total: Does not include data for pipelines because the data are unavailable.

Road: Includes only intercity truck activity on the Mexican federal highway system.

### United States

Road: Data are for intercity for-hire and private truck only.

Pipeline: Data are for both oil pipelines and natural gas.

## SOURCES

### Canada

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterways and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate, based on Statistics Canada data. (Ottawa, Ont.: 1998).

Road: Statistics Canada. *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).

### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1998).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1998).



Domestic Freight Activity by Mode—Continued

United States

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years).

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues).

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years).

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997).

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997).

# Domestic Freight Activity by Mode

(Billions (thousand millions) of ton-miles)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Total</b>	<b>356.6</b>	<b>412.9</b>	<b>420.8</b>	<b>105.5</b>	<b>141.1</b>	<b>145.7</b>	<b>3,472.6</b>	<b>3,962.2</b>	<b>4,052.3</b>
<b>Air</b>	<b>0.3</b>	<b>0.4</b>	<b>0.4</b>	<b>0.6</b>	<b>0.8</b>	<b>0.7</b>	<b>7.4</b>	<b>10.7</b>	<b>10.9</b>
<b>Water transport</b>	<b>36.8</b>	<b>29.1</b>	<b>27.5</b>	<b>13.2</b>	<b>13.7</b>	<b>13.6</b>	<b>833.5</b>	<b>807.7</b>	<b>764.7</b>
Coastal shipping	9.6	6.8	7.1	13.2	13.7	13.6	479.1	440.3	408.1
Great Lakes	5.0	3.5	3.7	NA	NA	NA	60.9	59.7	58.3
Inland waterways <sup>a</sup>	22.2	18.4	16.8	NA	NA	NA	293.5	307.7	298.3
<b>Pipeline</b>	<b>145.3</b>	<b>187.6</b>	<b>192.2</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>862.7</b>	<b>917.1</b>	<b>934.7</b>
Crude oil and petroleum products	70.4	71.2	71.9	U	U	U	584.1	601.1	619.2
Natural gas	74.9	116.4	120.3	U	U	U	278.6	316.0	315.5
<b>Rail</b>	<b>136.7</b>	<b>150.7</b>	<b>151.6</b>	<b>17.1</b>	<b>15.1</b>	<b>14.4</b>	<b>1,034.0</b>	<b>1,305.7</b>	<b>1,356.0</b>
<b>Road</b>	<b>37.5</b>	<b>45.1</b>	<b>49.0</b>	<b>74.6</b>	<b>111.5</b>	<b>117.0</b>	<b>735.0</b>	<b>921.0</b>	<b>986.0</b>

<sup>a</sup>Commercially navigable.

**KEY:** NA = Not applicable. U = Data are unavailable.

## NOTES

### Canada

Road: Data include only activity of Canadian domiciled for-hire carriers with annual intercity revenues greater than or equal to 1 million Canadian dollars. Data exclude local (less than 24 kilometers) deliveries, and deliveries made by private trucks and small for-hire carriers. Pipeline: Data are for both oil pipelines and natural gas.

### Mexico

Total: Does not include data for pipelines because the data are unavailable.

Road: Includes only intercity truck activity on the Mexican federal highway system.

### United States

Pipeline: Data are for both oil pipelines and natural gas.

Road: Data are for intercity for-hire and private truck only.

## SOURCES

### Canada

Air: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Coastal shipping, Great Lakes and inland waterways and rail: Transport Canada. Economic Analysis Directorate based on Statistics Canada data. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Transport Canada. Economic Analysis Directorate, based on Statistics Canada data. (Ottawa, Ont.: 1998).

Road: Statistics Canada. *Trucking in Canada, Catalogue No. 53-222-XPB*. (Ottawa, Ont.: various years).

### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras 1990-1996*. (Mexico City, D.F.: 1998).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Rail: Secretaría de Comunicaciones y Transportes. Based on data from Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1998).

Domestic Freight Activity by Mode—Continued

United States

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: various years).

Coastal shipping, Great Lakes and inland waterways: U.S. Army Corps of Engineers. *Waterborne Commerce of the U.S., Part 5*. (New Orleans, LA: Annual issues).

Pipeline, crude oil and petroleum products: Association of Oil Pipe Lines. *Shifts in Petroleum Transportation*. (Washington, DC: various years).

Pipeline, natural gas: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation based on Department of Energy data. (Washington, DC: 1999).

Rail: Association of American Railroads. *Railroad Facts, 1997*. (Washington, DC: 1997).

Road: Eno Transportation Foundation, Inc. *Transportation in America, 1997*. (Lansdowne, VA: 1997).

**table 5-3a**

# Top Canadian Domestic Freight Commodities by Mode: 1996

(Millions of U.S. short tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	
N	N	Forest products	44.4
		Live animals and food products	26.5
<b>Pipeline</b>		Petroleum products	25.5
Natural gas	132.4	Construction materials	20.3
Crude oil	131.1	Steel	15.8
Petroleum products	71.1	<b>Water transport</b>	
		Iron ore	7.8
<b>Rail</b>		Pulpwood and chips	7.4
Bituminous coal	43.9	Wheat	5.3
Iron ore and concentrates	41.2	Stone and limestone	5.1
Wheat	22.4	Fuel oil	4.8
Muriate of potassium (potash)	13.5	<b>Intermodal</b>	
Pulpwood and chips	12.9	N	N

**KEY:** N = Data are nonexistent.

## SOURCES

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB, 1996*. (Ottawa, Ont.: 1997). Statistics Canada. *Gas Utilities, Transport and Distribution Systems, Catalogue No. 57-205-XPB, 1996*. (Ottawa, Ont.: 1997).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB, 1996*. (Ottawa, Ont.: 1998).

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)



table 5-3b

# Top Mexican Domestic Freight Commodities by Mode: 1996

(Millions of U.S. short tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	
N	N	Miscellaneous manufactured articles	56.4
		Salt, sulfur, plaster and cement	39.7
<b>Pipeline</b>		Mineral fuels, oils and waxes	31.9
Crude oil	U	Edible fruits and vegetables	21.9
Natural gas	U	Beverages, spirits and vinegar	20.5
Petroleum products	U	<b>Water transport</b>	
		Crude oil and petroleum products	21.4
<b>Rail</b>		Limestone	8.0
Cement	10.3	Salt	6.9
Corn	6.5	Iron ore pellets	1.5
Iron ore	4.3	Cement	0.1
Coal	3.1	<b>Intermodal</b>	
Fuel oil	2.6	N	N

**KEY:** N = Data are nonexistent. U = Data are unavailable.

## NOTES

Road and water transport: Data are for 1993.

Road and rail: Data include foreign trade merchandise.

## SOURCES

Rail: Secretaría de Comunicaciones y Transportes. Based on data from the Ferrocarriles Nacionales de México. *Series Estadísticas, 1996*. (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte based on the vehicle's weight and dimensions study. (Sanfandila, Qro.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

**t a b l e 5-3c**

# Top U.S. Domestic Freight Commodities by Mode: 1993

(Millions of U.S. short tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	
Machinery, excluding electricals	0.51	Nonmetallic minerals	1,504.2
Chemicals or allied products	0.36	Petroleum or coal products	992.7
Electrical machinery, equipment or supplies	0.28	Food or kindred products	743.2
Transportation equipment	0.26	Lumber or wood products, excluding furniture	583.1
Instruments, photographic and optical goods, watches or clocks	0.10	Chemicals or allied products	310.5
<b>Pipeline</b>		<b>Water transport</b>	
Crude oil	1,019.6	Petroleum and petroleum products	930.6
Petroleum products	850.9	Crude materials	360.6
Natural gas	554.0	Coal	300.4
		Food and farm products	269.3
		Chemicals and related products	131.6
<b>Rail</b>		<b>Intermodal (road and rail combination)</b>	
Coal	631.1	Transportation equipment	7.6
Farm products	174.9	Chemicals or allied products	2.1
Nonmetallic minerals	144.9	Food or kindred products	1.9
Petroleum or coal products	136.2	Lumber or wood products, excluding furniture	1.7
Chemicals or allied products	130.3	Pulp, paper or allied products	1.6

## SOURCES

Air, road and rail: U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).

Pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. Special tabulation. (Washington, DC: 1998).

Water transport: U.S. Army Corps of Engineers (USACE). *Waterborne Commerce of the United States, Calendar Year 1996; Part 5 - National Summaries*. (New Orleans, LA: 1997).

table 5-4a

# Top Canadian Domestic Freight Interprovincial Pairs by Mode: 1996

(Thousands of U.S. short tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		Québec to Ontario	7,545
N	N	Alberta to British Columbia	3,360
<b>Pipeline</b>		British Columbia to Alberta	2,270
N	N	Alberta to Saskatchewan	1,963
<b>Rail</b>		<b>Water transport</b>	
Alberta to British Columbia	32,336	Ontario to Québec	6,820
Newfoundland to Québec	23,011	Québec to Ontario	6,573
Saskatchewan to British Columbia	14,209	Nova Scotia to Newfoundland	893
Saskatchewan to Ontario	9,093	Nova Scotia to Québec	821
Ontario to Québec	5,155	Nova Scotia to New Brunswick	750
<b>Road</b>		<b>Intermodal</b>	
Ontario to Québec	7,719	N	N

**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows.

## SOURCES

Rail: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Rail data adapted by Transport Canada from Statistics Canada sources.)

Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

# Top U.S. Domestic Freight Interstate Pairs by Mode: 1993

(Thousands of U.S. short tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		Illinois to Indiana	19,850
California to Texas	43	Pennsylvania to New Jersey	18,729
California to New Jersey	30	Michigan to Ohio	16,596
Indiana to California	24	New Jersey to New York	16,079
New Jersey to California	18		
California to Georgia	17	<b>Water transport</b>	
		Illinois to Louisiana	20,300
<b>Pipeline</b>		Missouri to Louisiana	12,222
N	N	West Virginia to Pennsylvania	12,057
		Louisiana to Texas	9,731
<b>Rail</b>		Iowa to Louisiana	9,511
Wyoming to Texas	41,456		
West Virginia to Virginia	23,854	<b>Intermodal</b>	
Wyoming to Kansas	21,464	<b>(road and rail combination)</b>	
Wyoming to Missouri	20,400	Kentucky to Michigan	1,089
Illinois to Indiana	18,960	California to Michigan	345
		Ohio to California	328
<b>Road</b>		Illinois to California	288
Indiana to Illinois	28,636	Michigan to Florida	180

**KEY:** N = Data are nonexistent.

**NOTE:** Data represent one-way flows.

**SOURCE:** U.S. Department of Commerce. U.S. Census Bureau. *1993 Commodity Flow Survey*. Special tabulation. (Washington, DC: 1998).



**table 5-5a**

# Top Canadian Domestic Freight Area Pairs by Mode: 1996

(Thousands of U.S. short tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		Toronto, Ont. to Hamilton, Ont.	1,063
N	N	Montréal, Que. to Québec, Que.	1,013
<b>Pipeline</b>		<b>Water transport</b>	
N	N	Sept-Îles/Pte-Noire, Que. to Hamilton, Ont.	3,631
<b>Rail</b>		Havre-St-Pierre, Que. to Sorel, Que.	2,697
N	N	Port-Cartier, Que. to Hamilton, Ont.	2,277
<b>Road</b>		Colborne, Ont. to Clarkson, Ont.	2,010
Hamilton, Ont. to Toronto, Ont.	2,994	Fraser River, B.C. to East Coast	
Toronto, Ont. to Montréal, Que.	2,272	Vancouver Island, B.C.	1,791
Montréal, Que. to Toronto, Ont.	1,789	<b>Intermodal</b>	
		N	N

**KEY:** N = Data are nonexistent.

**NOTES:** Data represent one-way flows.

Water data represent port to port pairs rather than metropolitan area pairs.

**SOURCES:** Road: Statistics Canada. Transportation Division. Special for-hire trucking tabulations for Transport Canada. (Ottawa, Ont.: 1998).

Water transport: Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998). (Tabulations derived from Statistics Canada's Marine Database.)

table 5-5b

# Top Mexican Domestic Freight Area Pairs by Mode: 1996

(Thousands of U.S. short tons)

Mode of transportation	Total	Mode of transportation	Total
<b>Air</b>		<b>Road</b>	
Mexico City, D.F. to Guadalajara, Jal.	7	Mexico City, D.F. to Nuevo Laredo, Tamps.	14,000
Mexico City, D.F. to Tijuana, B.C.	6	Mexico City, D.F. to Monterrey, N.L.	8,200
Mexico City, D.F. to Cancún, Q. Roo.	4	Mexico City, D.F. to Guadalajara, Jal.	6,700
Guadalajara, Jal. to México City, D.F.	4	Mexico City, D.F. to Veracruz, Ver.	5,200
Mexico City, D.F. to Monterrey, N.L.	4	Mexico City, D.F. to Toluca, Edo. de Mex.	4,900
<b>Pipeline</b>		<b>Water transport</b>	
U	U	Guerrero Negro, B.C.S. to Isla de Cedros, B.C.	8,200
<b>Rail</b>		Pajaritos, Ver. to Tuxpan, Ver.	4,400
Nuevo Laredo, Tamps. to Monterrey, N.L.	1,712	Salina Cruz, Oax. to Guaymas, Son.	2,500
Nuevo Laredo, Tamps. to Mexico City, D.F.	1,401	Salina Cruz, Oax. to Manzanillo, Col.	2,300
Veracruz, Ver. to Mexico City, D.F.	885	Salina Cruz, Oax. to Lázaro Cárdenas, Mich.	1,400
Ciudad Sahagún, Hgo. to Mexico City, D.F.	863	<b>Intermodal</b>	
Nuevo Laredo, Tamps. to Guadalajara, Jal.	768	N	N

**KEY:** N = Data are nonexistent. U = Data are unavailable.

## NOTES

Data represent one-way flows.

Rail: Figures of 1993, based on allocation studies (see Appendix B).

Road: Figures of 1994, from a survey of motor carrier vehicles on federal roads (see Appendix B).

Water transport: Data represent port to port pairs rather than metropolitan area pairs.

## SOURCES

Air: Instituto Mexicano del Transporte based on special tabulations of the Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Sanfandila, Qro.: 1999).

Rail: Instituto Mexicano del Transporte. *Evaluación Económica de Mejoras a la Infraestructura del Sistema Nacional Ferroviario, Publicación Técnica No. 82*. Estimates included in this document are based on information from the Ferrocarriles Nacionales de México. (Sanfandila, Qro.: 1996).

Road: Instituto Mexicano del Transporte. Special tabulation from *Estudio de pesos y dimensiones de los vehiculos de carga que circulan en la red nacional de carreteras, 1994*. (Sanfandila, Qro.: 1999).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1997).

**table 6-2a**

# Canadian Merchandise Trade With Mexico and the United States by Mode of Transportation

(Thousands of U.S. short tons)

	1990 <sup>e</sup>	1995 <sup>e</sup>	1996 <sup>e</sup>
<b>Total trade with Mexico</b>	<b>2,264</b>	<b>5,074</b>	<b>5,147</b>
Air	31	81	50
Water transport	1,437	2,765	2,863
Road	459	1,046	856
Rail	320	487	413
Pipeline and other <sup>a</sup>	17	715	964
<b>Exports to Mexico</b>	<b>762</b>	<b>2,459</b>	<b>2,408</b>
Air	7	26	5
Water transport	506	2,086	2,146
Road	86	159	87
Rail	164	188	170
Pipeline and other <sup>a</sup>	NS	NS	NS
<b>Imports from Mexico</b>	<b>1,501</b>	<b>2,635</b>	<b>2,739</b>
Air	24	55	45
Water transport	933	680	717
Road	373	887	769
Rail	155	299	243
Pipeline and other <sup>a</sup>	17	715	964
<b>Total trade with the United States</b>	<b>270,960</b>	<b>390,600</b>	<b>405,635</b>
Air	2,995	2,710	2,622
Water transport	74,839	79,912	85,286
Road	73,979	105,215	108,166
Rail	45,137	66,499	67,497
Pipeline and other <sup>a</sup>	74,011	136,264	142,065
<b>Exports to the United States</b>	<b>193,589</b>	<b>295,955</b>	<b>305,922</b>
Air	198	460	226
Water transport	44,144	49,890	53,368
Road	42,374	57,253	59,861
Rail	35,584	53,267	54,603
Pipeline and other <sup>a</sup>	71,288	135,084	137,861
<b>Imports from the United States</b>	<b>77,372</b>	<b>94,645</b>	<b>99,717</b>
Air	2,797	2,250	2,396
Water transport	30,695	30,022	31,919
Road	31,604	47,962	48,304
Rail	9,554	13,232	12,894
Pipeline and other <sup>a</sup>	2,722	1,179	4,204

<sup>a</sup>Mostly pipeline moves; also includes mail, parcel post and other miscellaneous modes of transportation.**KEY:** e = Data are estimated. NS = Not significant.**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

**table** 6-2b

# Mexican Merchandise Trade With Canada and the United States by Mode of Transportation

(Thousands of U.S. short tons)

	1990	1995	1996
<b>Total trade with Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 2	2	2
Water transport	1,571	<sup>b</sup> 3,778	3,095
Road	N	N	N
Rail	U	U	U
Pipeline	NA	NA	NA
<b>Exports to Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 1	1	1
Water transport	1,159	<sup>b</sup> 1,893	1,089
Road	N	N	N
Rail	U	U	U
Pipeline	NA	NA	NA
<b>Imports from Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 1	1	1
Water transport	412	<sup>b</sup> 1,885	2,006
Road	N	N	N
Rail	U	U	U
Pipeline	NA	NA	NA
<b>Total trade with the United States</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 77	128	155
Water transport	65,334	<sup>b</sup> 79,888	99,100
Road	N	N	42,690
Rail	U	U	16,667
Pipeline	U	U	U
<b>Exports to the United States</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 33	66	82
Water transport	54,784	<sup>b</sup> 68,010	85,592
Road	N	N	15,964
Rail	U	U	5,305
Pipeline	U	U	U
<b>Imports from the United States</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	<sup>a</sup> 44	62	74
Water transport	10,550	<sup>b</sup> 11,877	13,508
Road	N	N	26,727
Rail	U	U	11,362
Pipeline	U	U	U

<sup>a</sup>Data for 1990 are nonexistent. Data in this table represent 1992.<sup>b</sup>Data for 1995 are nonexistent. Data in this table represent 1994.**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.



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**t a b l e 6-2b****Mexican Merchandise Trade With Canada and the United States by Mode of Transportation—Continued****SOURCES**

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. Special tabulation. (Mexico City, D.F.: 1997).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

Road and rail, 1996: Instituto Mexicano del Transporte. Special tabulations based on data from the Secretaría de Comercio y Fomento Industrial and U.S. Bureau of Transportation Statistics. (Querétaro, Qro.: 1998).

**table 6-2c**

# U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

(Thousands of U.S. short tons)

	1990	1995	1996
<b>Total trade with Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	245	278	297
Water transport	72,143	75,518	79,381
Road	N	N	N
Rail	N	N	N
Pipeline	N	N	N
<b>Exports to Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	188	237	248
Water transport	27,772	28,353	27,454
Road	N	N	N
Rail	N	N	N
Pipeline	N	N	N
<b>Imports from Canada</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	56	42	49
Water transport	44,371	47,166	51,928
Road	N	59,044	63,719
Rail	N	51,004	53,809
Pipeline	N	67,665	69,323
<b>Total trade with Mexico</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	49	71	91
Water transport	57,475	79,753	83,710
Road	N	N	N
Rail	N	N	N
Pipeline	N	N	N
<b>Exports to Mexico</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	29	31	41
Water transport	9,449	9,515	14,437
Road	N	N	N
Rail	N	N	N
Pipeline	N	N	N
<b>Imports from Mexico</b>	<b>N</b>	<b>N</b>	<b>N</b>
Air	20	40	51
Water transport	47,525	70,238	70,375
Road	N	N	15,964
Rail	N	N	5,307
Pipeline	N	N	125

**KEY:** N = Data are nonexistent.**NOTES**

Imports from Canada: The U.S. Customs Service began to require shipping weight for U.S. imports from Canada by all modes of transportation in 1990. However, it did not become possible to disaggregate the land modes (road, rail and pipeline) until 1994.

Imports from Mexico: The U.S. Customs Service began to require shipping weight for U.S. imports from Mexico by land modes of transportation (road, rail and pipeline) in April 1995.

Road, rail and pipeline exports: For 1990, 1995 and 1996, the U.S. Census Bureau did not require shippers to report weight for export shipments to Canada or Mexico for these modes of transportation.

## U.S. Merchandise Trade With Canada and Mexico by Mode of Transportation

### SOURCES

Total trade: U.S. Department of Commerce. U.S. Census Bureau. *Statistical Abstract of the United States*. (Washington, DC: 1990, 1995 and 1996).

Air and water: U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *FT920 U.S. Merchandise Trade*. (Washington, DC: December 1990, 1995 and 1996).

Road, rail and pipeline: U.S. Department of Transportation. Bureau of Transportation Statistics. *Transborder Surface Freight Data*. (Washington, DC: 1998).

**table 6-4a**

# Top Mexican Maritime Intransit Shipment Ports:<sup>a</sup> January-June 1997

(Thousands of U.S. dollars or U.S. short tons)

	Value	Weight
<b>To/from the United States</b>		
U.S. overseas exports transshipped through Mexican maritime ports	N	23.8
Port of Manzanillo, Col.	N	17.3
Port of Veracruz, Ver.	N	6.0
Port of Lázaro Cárdenas, Mich.	N	0.3
Port of Progreso, Yuc.	N	0.2
Port of Ensenada, B.C.	N	0.1
U.S. overseas imports transshipped through Mexican maritime ports	N	101.9
Port of Tampico, Tamps.	N	55.8
Port of Tuxpan, Ver.	N	25.2
Port of Veracruz, Ver.	N	11.2
Port of Manzanillo, Col.	N	5.1
Port of Altamira, Tamps.	N	4.6
<b>To/from Canada</b>		
Canadian overseas exports transhipped through Mexican maritime ports	N	0
Canadian overseas imports transhipped through Mexican maritime ports	N	0

<sup>a</sup>Ports are ranked on total intransit shipment weight.**KEY:** N = Data are nonexistent.**NOTE:** Data are unavailable for 1996.**SOURCE:** Instituto Mexicano del Transporte. Special tabulation based on 1997 data from the Journal of Commerce. *Port Import Export Reporting Service (PIERS)*. (Querétaro, Qro.: 1998).



**table 6-4b****Top U.S. Maritime Intransit Shipment Ports:<sup>a</sup> 1996**

(Thousands of U.S. dollars or U.S. short tons)

	Value	Weight
<b>To/from Canada</b>		
<b>Canadian overseas exports transshipped through U.S. maritime ports</b>	<b>199,519</b>	<b>80.6</b>
Port of Los Angeles, CA	119,143	33.6
Port of Long Beach, CA	70,791	42.2
Port of Norfolk, VA	4,964	2.5
Port of New York, NY	1,111	1.0
Port of Houston, TX	822	0.4
<b>Canadian overseas imports transshipped through U.S. maritime ports</b>	<b>442,627</b>	<b>92.9</b>
Port of Superior, WI	132,496	1.8
Port of Los Angeles, CA	83,079	12.6
Port of Duluth, MN	55,096	0.7
Port of Brownsville, TX	44,438	31.3
Port of Seattle, WA	37,781	9.1
<b>To/from Mexico</b>		
<b>Mexican overseas exports transshipped through U.S. maritime ports</b>	<b>420,320</b>	<b>1,224.8</b>
Port of Long Beach, CA	171,012	23.9
Port of Brownsville, TX	90,559	58.8
Port of Los Angeles, CA	46,716	14.9
Port of Charleston, SC	39,688	6.0
Port of Houston, TX	21,969	4.6
<b>Mexican overseas imports transshipped through U.S. maritime ports</b>	<b>584,373</b>	<b>1,225.4</b>
Port of Los Angeles, CA	161,817	48.9
Port of Long Beach, CA	133,015	50.7
Port of Portland, ME	126,073	980.6
Port Everglades, FL	34,136	2.1
Port of Miami, FL	30,612	3.3

<sup>a</sup>Ports are ranked on total intransit shipment value.**SOURCE:** U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. *Annual Waterborne Databanks 1996* (formerly TA 305/705). (Washington, DC: 1998).

table 7-2

# International Merchandise Trade Between North America and the Rest of the World by Weight

(Millions of U.S. short tons)

	Canada			Mexico			United States		
	1990 <sup>e</sup>	1995 <sup>e</sup>	1996 <sup>e</sup>	1990	1995	1996	1990	1995	1996
<b>Total trade</b>	<b>263.5</b>	<b>241.1</b>	<b>259.8</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>831.0</b>	<b>911.6</b>	<b>906.1</b>
Exports	197.9	169.6	188.7	U	U	U	374.1	406.4	384.4
Imports	65.6	71.3	71.2	U	U	U	456.9	505.2	521.7
<b>Air, total trade</b>	<b>0.8</b>	<b>2.0</b>	<b>1.2</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>3.2</b>	<b>4.7</b>	<b>5.1</b>
Exports	0.2	0.6	0.3	U	U	U	1.4	2.2	2.4
Imports	0.6	1.4	0.9	U	U	U	1.8	2.5	2.6
<b>Water, total trade</b>	<b>242.2</b>	<b>223.1</b>	<b>242.7</b>	<b>U</b>	<b>U</b>	<b>44.8</b>	<b>827.8</b>	<b>906.9</b>	<b>901.0</b>
Exports	196.1	166.9	186.4	U	U	34.5	372.7	404.2	382.0
Imports	46.1	56.3	56.3	U	U	10.3	455.1	502.7	519.1
<b>Road, total trade</b>	<b>5.5</b>	<b>6.8</b>	<b>5.0</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	1.3	2.0	1.7	U	U	U	U	U	U
Imports	4.2	4.7	3.3	U	U	U	U	U	U
<b>Rail, total trade</b>	<b>1.3</b>	<b>0.9</b>	<b>0.7</b>	<b>U</b>	<b>0.2</b>	<b>0.4</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	0.2	0.3	0.2	U	0.2	0.4	U	U	U
Imports	1.1	0.6	0.4	U	NS	NS	U	U	U
<b>Pipeline and other, total trade</b>	<b>13.7</b>	<b>8.3</b>	<b>10.1</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>U</b>	<b>U</b>	<b>U</b>
Exports	0.0	NS	NS	N	N	N	U	U	U
Imports	13.7	8.3	10.1	N	N	N	U	U	U

**KEY:** e = Data are estimated. N = Data are nonexistent. NS = Not significant. U = Data are unavailable.

## NOTES

### All Countries

Intra-North American trade is excluded from these figures (e.g., Canada's trade with Mexico and the United States is excluded; Mexico's trade with Canada and the United States is excluded; and the United State's trade with Mexico and Canada is excluded).

### Canada

All land modes: Canada export data for all land modes represent transshipments (e.g., trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

### Mexico

Total, air and road: Data were not available that excluded trade with Canada and the United States. See Appendix B for available data for Mexican air and road trade with all countries.

Rail: Represents trade with Central American countries. Data were unavailable for 1990 that excluded trade with Canada and the United States. See Appendix B for Mexican rail trade with all countries.

Water: Data were unavailable for 1990 and 1995 that excluded trade with Canada and the United States. See Appendix B for Mexican water trade with all countries.

### United States

Total: Includes only air and water shipments.

Road, rail and pipeline: Data for these modes are included in U.S. trade with Canada and U.S trade with Mexico. Data for these modes are therefore shown in Table 6-6.

## table 7-2

### International Merchandise Trade Between North America and the Rest of the World by Weight—*Continued*

#### SOURCES

##### Canada

Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).

##### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. *La Aviación Mexicana en Cifras, 1989-1995*. (Mexico City, D.F.: 1996).

Water: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

Road: Instituto Mexicano del Transporte. *Manual Estadístico del Sector Transporte, 1997*. (Querétaro, Qro.: 1998).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

##### United States

Air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996*. (Washington, DC: 1998).

# Top Canadian International Trade Commodities by Weight: 1996

(Excluding Trade With the United States and Mexico)

(Thousands of U.S. short tons)

	1996		1996
<b>Overall exports</b>		<b>Land exports (road only)</b>	
Special transactions-trade (99)	66,977	Ores, slag and ash (26)	330
Mineral fuels, oils and waxes (27)	38,313	Paper and paperboard (48)	170
Ores, slag and ash (26)	21,608	Edible vegetables and roots (07)	111
Cereals (10)	19,882	Vehicles other than railway (87)	101
Pulp of wood and paperboard (47)	6,775	Other made up textile articles (63)	77
<b>Overall imports</b>		<b>Land imports (road only)</b>	
Mineral fuels, oils and waxes (27)	42,279	Edible fruit and nuts (08)	647
Special transactions-trade (99)	4,490	Nuclear reactors, boilers, machinery and parts (84)	370
Ores, slag and ash (26)	3,833	Special classification provisions (98)	284
Inorganic chemicals (28)	3,245	Iron and steel (72)	256
Iron and steel (72)	2,792	Toys, games and sporting equipment (95)	227
<b>Air exports</b>		<b>Water exports</b>	
Iron and steel (72)	68	Special transactions-trade (99)	66,849
Special transactions-trade (99)	64	Mineral fuels, oils and waxes (27)	38,304
Nuclear reactors, boilers, machinery and parts (84)	39	Ores, slag and ash (26)	21,278
Electrical machinery, equipment and parts (85)	35	Cereals (10)	19,849
Fish and crustaceans (03)	16	Pulp of wood and paperboard (47)	6,710
<b>Air imports</b>		<b>Water imports</b>	
Nuclear reactors, boilers, machinery and parts (84)	125	Mineral fuels, oils and waxes (27)	32,015
Special classification provisions (98)	116	Special transactions-trade (99)	4,413
Live trees and plants (06)	113	Ores, slag and ash (26)	3,619
Electrical machinery, equipment and parts (85)	93	Inorganic chemicals (28)	3,218
Ores, slag and ash (26)	60	Iron and steel (72)	2,533

## NOTES

Merchandise trade with the United States and Mexico is excluded from these data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

All land modes: Canada export data for all land modes represent transshipments (e.g., trade shipments between Canada and a third country that were transshipped via the United States). Canadian import data are based on the last mode of transport by which the cargo was transported to the port of clearance in Canada.

**SOURCE:** Statistics Canada. International Trade Division. Special tabulations. (Ottawa, Ont.: 1998).



# Top U.S. International Trade Commodities by Weight: 1996 (Excluding Trade With Canada and Mexico)

(Thousands of U.S. short tons)

	1996		1996
<b>Overall exports</b>		Electrical machinery, equipment and parts (85)	346
Mineral fuels, oils and waxes (27)	126	Not knitted or crocheted apparel (62)	219
Cereals (10)	89	Live trees and plants (6)	200
Oil seeds and oleaginous fruits(12)	28	Knitted or crocheted apparel (61)	157
Wood and articles (44)	23		
Food residues and waste (23)	15	<b>Land exports</b>	
<b>Overall imports</b>		U	U
Mineral fuels, oils and waxes (27)	353	<b>Land imports</b>	
Iron and steel (72)	25	U	U
Ores, slag and ash (26)	25		
Salt, sulfur, plaster and cement (25)	22	<b>Water exports</b>	
Inorganic chemicals (28)	10	Mineral fuels, oils and waxes (27)	125,180
<b>Air exports</b>		Cereals (10)	88,851
Nuclear reactors, boilers, machinery and parts (84)	548	Oil seeds and oleaginous fruits (12)	27,813
Electrical machinery, equipment and parts (85)	364	Wood and articles (44)	23,597
Measuring and testing instruments (90)	140	Food residues and waste (23)	15,549
Vehicles other than railway (87)	88	<b>Water imports</b>	
Plastics (39)	82	Mineral fuels, oils and waxes (27)	353,118
<b>Air imports</b>		Iron and steel (72)	25,831
Nuclear reactors, boilers, machinery and parts (84)	479	Ores, slag and ash (26)	24,919
		Salt, sulfur, plaster and cement (25)	22,155
		Inorganic chemicals (28)	10,201

**KEY:** U = Data are unavailable.

**NOTES:** Merchandise trade with Canada and Mexico is excluded from these data.

Commodity code: Description based on the two-digit Harmonized Commodity Description and Coding System (HS).

Total: Includes air and water shipments, excluding trade with Canada and Mexico.

Land (road and rail): Data for these modes are included in U.S. trade with Canada and U.S trade with Mexico for 1996.

**SOURCES:** Overall, air and water: U.S. Department of Transportation. Maritime Administration. Office of Statistical and Economic Analysis. Special tabulation based on U.S. Department of Commerce. U.S. Census Bureau. Foreign Trade Division. *U.S. Imports and Exports of Merchandise, December 1990, 1995 and 1996.* (Washington, DC: 1998).

**table 8-1**

# Domestic Passenger Travel by Mode

(Billions (or thousand millions) of passenger-miles)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Passenger-miles, total</b>	<b>N</b>	<b><sup>e</sup>325</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>3,543</b>	<b>4,130</b>	<b>4,252</b>
<b>Air</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>6.0</b>	<b>8.6</b>	<b><sup>e</sup>8.1</b>	<b>359</b>	<b>414</b>	<b>445</b>
Air carriers	<sup>r</sup> 16	<sup>r</sup> 16	<sup>r</sup> 17	6.0	8.6	<sup>e</sup> 8.1	346	404	435
<b>Road</b>	<b>N</b>	<b><sup>e</sup>309</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>3,159</b>	<b>3,690</b>	<b>3,779</b>
Personal vehicles	N	<sup>e</sup> 290	N	N	N	N	3,037	3,554	3,641
Passenger cars	N	<sup>e</sup> 229	N	N	N	N	2,129	2,287	2,334
Motorcycles	N	<sup>e</sup> 1	N	N	N	N	12	11	11
Light trucks	N	<sup>e</sup> 60	N	N	N	N	896	1,256	1,296
Bus	N	<sup>e</sup> 19	N	N	N	N	121	136	139
Charter	N	<sup>e</sup> 2	N	N	N	N	N	N	N
Intercity	N	<sup>e</sup> 2	N	<sup>e</sup> 168.7	<sup>e</sup> 238.0	<sup>e</sup> 242.6	N	N	N
Local motor	N	<sup>e</sup> 8	N	N	N	N	21	19	19
School	N	<sup>e</sup> 8	N	N	N	N	N	N	N
<b>Rail</b>									
Intercity passenger	0.9	0.9	0.9	3.3	1.2	1.1	6	6	5
<b>Transit</b>	<b>N</b>	<b><sup>a</sup></b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>41</b>	<b>40</b>	<b>41</b>
Transit rail	N	N	N	N	N	N	19	20	21
<b>Water transport</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>0.12</b>	<b>0.12</b>	<b>0.12</b>	<b>N</b>	<b>N</b>	<b>N</b>

<sup>a</sup>Data for all transit services for 1995 are included in the estimate for local motor bus, under road. The transit rail portion of transit services cannot be broken out.

**KEY:** e = Data are estimated. N = Data are nonexistent. p = Data are preliminary. r = Data are revised.

## NOTES

### All Countries

**Air:** The U.S. total for air represents both air carriers and general aviation. However, only the large certificated air carriers are included. See Appendix B for a more complete explanation. The Mexican air total represents only scheduled air carriers. However, nonscheduled and general aviation represent a very small share of passenger travel in Mexico. Canadian data for total air activity are nonexistent because data for general aviation are not collected.

**Road:** Data do not include passenger travel by commercial freight vehicles.

**Transit and water transport:** For the United States, ferry activity is included in the total for transit. For Mexico, data for overall transit activity are nonexistent because the data are not collected. However, Mexican data for water transport do represent ferry activity. Canadian data for transit overall and ferry activity are nonexistent because the data are not collected.

### Canada

**Air carriers:** Includes level I to III Canadian air carriers. For a definition of these, see Appendix B.

### Mexico

**Air:** Data for general aviation are not included in the air total.

**Intercity bus:** Data refer to intercity buses utilizing Mexico's federal highway system.

### United States

**Passenger-miles, total:** Is not the sum of the subcategories because local motor bus is included in both the road and transit totals. This double counting has been removed from the overall total.

# Domestic Passenger Travel by Mode—Continued

## SOURCES

### Canada

Air carriers: Statistics Canada. *Canadian Civil Aviation, Catalogue No. 51-206-XPB*. (Ottawa, Ont.: various years).

Road: Transport Canada. Ministry of Public Works and Government Services. *Transportation in Canada 1997 - Annual Report*. (Ottawa, Ont.: 1998).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

### Mexico

Air: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Autotransporte Federal. (Mexico City, D.F.: 1997).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas, 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

Water transport: Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. (Mexico City, D.F.: 1998).

### United States

Air: U.S. Department of Transportation. Bureau of Transportation Statistics. Office of Airline Information. *Air Carrier Traffic Statistics*. (Washington, DC: 1986-1997).

U.S. Department of Transportation. Federal Aviation Administration. *Statistical Handbook of Aviation 1996*. Web site: [www.bts.gov](http://www.bts.gov)

Road: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, Summary to 1995*. (Washington, DC: 1996).

U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics, 1996*. (Washington, DC: 1997).

American Public Transit Association (APTA). *Transit Fact Book*. (Washington, DC: various years).

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact Book*. (Washington, DC: various years).

# Domestic Physical System Extent

(Miles)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Road</b>	<b>552,336</b>	<b>560,417</b>	<b>U</b>	<b>148,654</b>	<b>191,372</b>	<b>194,055</b>	<b>3,880,000</b>	<b>3,912,000</b>	<b>3,934,000</b>
Paved	184,803	197,546	U	52,149	59,988	61,618	2,259,000	2,373,000	2,380,000
Major road system	N	N	N	50,652	57,652	58,973	407,000	430,000	433,000
Less than four lanes	N	N	N	47,221	52,054	53,032	280,000	291,000	292,000
Four or more lanes	9,641	10,297	U	3,431	5,599	5,942	128,000	139,000	141,000
Local	N	N	N	N	N	N	1,852,000	1,942,000	1,947,000
Unpaved	367,533	362,871	U	96,505	131,384	132,437	1,621,000	1,539,000	1,554,000
<b>Great Lakes</b>	<b>1,654</b>	<b>1,654</b>	<b>1,654</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>4,400</b>	<b>4,400</b>	<b>4,400</b>
<b>Inland waterways<sup>a</sup></b>	<b>1,755</b>	<b>1,755</b>	<b>1,755</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>26,000</b>	<b>26,000</b>	<b>26,000</b>
<b>Pipeline</b>	<b>170,349</b>	<b>192,484</b>	<b>195,188</b>	<b>11,187</b>	<b>9,703</b>	<b>9,649</b>	<b>1,415,646</b>	<b>1,462,652</b>	<b>1,469,534</b>
Gas	148,556	169,554	172,223	8,049	7,118	7,050	1,206,894	1,262,152	1,269,034
Oil	21,794	22,929	22,965	3,137	2,586	2,599	208,752	200,500	200,500
<b>Rail<sup>b</sup></b>	<b>53,985</b>	<b>49,912</b>	<b>48,086</b>	<b>16,380</b>	<b>16,537</b>	<b>16,543</b>	<b>200,074</b>	<b>180,419</b>	<b>176,978</b>
<b>Transit rail</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>122</b>	<b>171</b>	<b>171</b>	<b>N</b>	<b>3,932</b>	<b>4,325</b>

<sup>a</sup>Commercially navigable.

<sup>b</sup>Rail extent includes yard tracks, sidings and parallel lines.

**KEY:** N = Data are nonexistent. NA = Not applicable. U = Data are unavailable.

## NOTES

### All Countries

Road: The overall road total for Canada and the United States includes all roads (highways, local and others). Canada cannot disaggregate its data for local roads into paved and unpaved, however.

Rail: Data include length of track, including yard tracks, sidings and parallel lines.

Transit rail: Data are one-way, fixed guideway

### Mexico

Road: Data do not include local roads.

Road, paved: Data include major roads plus minor rural roads.

## SOURCES

### Canada

Road: Transportation Association of Canada. *Transportation in Canada: A Statistical Overview - 1995*. (Ottawa, Ont.: 1998).

Great Lakes and inland waterways: Transport Canada. *Marine Distance Library, 1997*. (Ottawa, Ont.: 1998).

Pipeline: Statistics Canada. *Oil Pipeline Transport, Catalogue No. 55-201-XPB*, and *Gas Utilities, Transport and Distribution Systems, Catalogue No. 57-205-XPB*. (Ottawa, Ont.: various years).

Rail: Statistics Canada. *Rail in Canada, Catalogue No. 52-216-XPB*. (Ottawa, Ont.: various years).

### Mexico

Road: Secretaría de Comunicaciones y Transportes. Dirección General de Evaluación. *Longitud de la Infraestructura Carretera, 1990, 1995 and 1996*. (Mexico City, D.F.: various years).

Pipeline: Instituto Nacional de Estadística, Geografía e Informática, based on data from the Petróleos Mexicanos. Subdirección de Planeación and the *Anuario Estadístico* (various years). (Aguascalientes, Ags.: various years).

Rail: Ferrocarriles Nacionales de México. *Series Estadísticas 1990, 1995 y 1996*. (Mexico City, D.F.: various years).

Transit: Instituto Nacional de Estadística, Geografía e Informática, based on data collected by the Sistema de Transporte Colectivo and the Sistema de Transporte Eléctrico in Mexico City, the Sistema de Transporte Colectivo de la Zona Metropolitana de Guadalajara, and the Sistema de Transporte Colectivo in Monterrey. (Mexico City, D.F.: various years).



## Domestic Physical System Extent—Continued

## United States

Road: U.S. Department of Transportation. Federal Highway Administration (FHWA). Unpublished data. (Washington, DC: 1998).

Great Lakes and inland waterways: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).

Gas pipeline: American Gas Association. *Gas Facts*. (Arlington, VA: 1997).

Oil pipeline: Eno Transportation Foundation, Inc. *Transportation in America*. (Lansdowne, VA: 1997).

Freight rail: Association of American Railroads. *Railroad Facts*. (Washington, DC: 1997).

Intercity passenger rail: National Railroad Passenger Corp. *Amtrak Annual Report 1996*. (Washington, DC: 1996).

Transit rail: American Public Transit Association. *Transit Fact book 1996*. (Washington, DC: 1996).

**table 11-4a**

# Top 20 Canadian Water Ports by Tonnage (Domestic and International): 1996

(Thousands of U.S. short tons)

Port name	Total	Domestic	International	Containerized shipments (as percent of total tonnage)	Number of vessel entrances/ clearances
Vancouver, B.C.	78,711	2,192	76,518	7.2	5,673
Sept-Îles/Pte-Noire, Que.	24,895	4,648	20,246	NS	615
Port-Cartier, Que.	23,952	5,657	18,295	NS	521
Saint John, N.B.	22,680	2,151	20,529	1.2	825
Montréal/Contrecoeur, Que.	21,173	5,799	15,374	41.1	1,827
Québec/Lévis, Que.	18,725	4,058	14,667	NS	740
Halifax, N.S.	14,977	2,975	12,002	29.6	1,761
Hamilton, Ont.	14,062	6,822	7,240	NS	638
Thunder Bay, Ont.	11,134	7,237	3,898	NS	518
Prince Rupert, B.C.	10,419	15	10,404	NS	561
Port Hawkesbury, N.S.	8,692	36	8,655	NS	180
Fraser River, B.C.	8,297	5,954	2,344	1.6	3,479
Come-By-Chance, Nfld.	8,191	115	8,077	NS	148
Nanticoke, Ont.	7,485	1,842	5,643	NS	305
Baie-Comeau, Que.	6,467	2,022	4,446	NS	1,089
Sorel, Que.	6,151	3,644	2,507	NS	317
Sault Ste. Marie, Ont.	5,679	601	5,078	NS	291
Windsor, Ont.	5,600	2,763	2,836	NS	422
Howe Sound, B.C.	5,362	5,353	9	NS	2,517
East Coast Vancouver Island, B.C.	4,478	4,478	-	NS	2,467
Subtotal-top 20 ports	307,129	68,362	238,767	6.3	24,894
<b>Tonnage, total all Canadian water ports</b>	<b>394,359</b>	<b>107,650</b>	<b>286,709</b>	<b>NA</b>	<b>NA</b>
<b>Percent of tonnage of all Canadian water ports</b>	<b>78</b>	<b>64</b>	<b>83</b>	<b>5.0</b>	<b>NA</b>

**KEY:** NA Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

## SOURCES

Statistics Canada. *Shipping in Canada, Catalogue No. 54-205-XPB, 1996.* (Ottawa, Ont.: 1998).

Statistics Canada. Transportation Division. Special tabulations. (Ottawa, Ont.: 1998).

t	a	b	l	e	11-4b
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## Top 20 Mexican Water Ports by Tonnage (Domestic and International): 1996

(Thousands of U.S. short tons)

Port name	Total	Domestic	International	Containerized shipments (as percent of total tonnage)	Number of vessel entrances/ clearances
Cayo Arcas, Camp.	34,691	4	34,686	NA	417
Pajaritos, Ver.	34,560	6,702	27,858	NA	954
Dos Bocas, Tab.	25,835	49	25,786	NA	1,145
Salina Cruz, Oax.	18,517	12,785	5,732	0.8	537
Isla Cedros, B.C.	16,297	8,277	8,019	NA	1,189
Lázaro Cárdenas, Mich.	13,235	4,102	9,134	0.8	425
Manzanillo, Col.	11,016	4,209	6,808	16.8	704
Veracruz, Ver.	10,932	696	10,236	23.2	1,396
Tampico, Tamps.	9,231	2,635	6,596	6.4	1,148
Tuxpan, Ver.	7,768	4,658	3,110	0.1	327
Guerrero Negro, B.C.S.	7,595	7,595	N	NA	1,077
Guaymas, Son.	6,239	2,704	3,535	NA	496
Punta Venado, Q. Roo.	6,637	NS	6,637	NA	106
Topolobampo, Sin.	3,275	3,090	185	NA	247
San Marcos, B.C.S.	3,071	7	3,064	NA	308
Rosarito, B.C.	2,908	1,791	1,117	NA	99
Coatzacoalcas, Ver.	2,682	601	2,081	NA	267
Altamira, Tamps.	2,661	138	2,523	41.6	667
Progreso, Yuc.	2,560	1,044	1,516	3.7	462
La Paz-Pichilingue, B.C.S.	2,221	2,041	180	NS	600
Subtotal-top 20 ports	221,929	63,126	158,803	2.9	12,571
<b>Tonnage, total all Mexican water ports</b>	<b>229,786</b>	<b>69,805</b>	<b>159,980</b>	<b>NA</b>	<b>NA</b>
<b>Percent of tonnage of all Mexican water ports</b>	<b>96.6</b>	<b>90.4</b>	<b>99.3</b>	<b>2.8</b>	<b>NA</b>

**KEY:** N = Data are nonexistent. NA = Not applicable. NS = Not significant.

**NOTE:** Ports are ranked by total tonnage.

**SOURCE:** Secretaría de Comunicaciones y Transportes. Coordinación General de Puertos y Marina Mercante. *Los Puertos Mexicanos en Cifras 1990-1996*. (Mexico City, D.F.: 1997).

table 11-4c

# Top 20 U.S. Water Ports by Tonnage (Domestic and International): 1996

(Thousands of U.S. short tons)

Port name	Total	Domestic	International	Containerized shipments (as percent of total tonnage)	Number of vessel entrances/ clearances
South Louisiana, LA	189,800	106,000	83,800	NS	153,386
Houston, TX	148,200	61,100	87,100	4.0	122,329
New York, NY and NJ	131,600	75,100	56,500	12.6	228,526
New Orleans, LA	83,700	36,800	46,900	3.6	125,116
Baton Rouge, LA	81,000	45,200	35,800	NS	68,922
Corpus Christi, TX	80,500	23,800	56,600	NS	32,957
Valdez, AK	77,100	75,000	2,200	NS	3,186
Plaquemine, LA	66,900	46,200	20,700	NS	65,780
Long Beach, CA	58,400	22,400	36,000	35.0	56,465
Texas City, TX	56,400	21,100	35,300	NS	23,462
Pittsburgh, PA	50,900	50,900	-	NS	118,283
Mobile, AL	50,900	25,400	25,500	NS	47,943
Tampa, FL	49,300	32,500	16,800	NS	10,234
Norfolk Harbor, VA	49,300	10,400	38,900	15.0	32,064
Lake Charles, LA	49,100	19,700	29,400	NS	49,303
Los Angeles, CA	45,700	17,900	27,800	37.8	37,226
Baltimore, MD	43,600	14,000	29,600	8.7	34,208
Philadelphia, PA	41,900	13,000	28,900	2.6	25,185
Duluth-Superior, MN and WI	41,400	30,200	11,200	NS	2,400
Port Arthur, TX	37,200	6,500	30,700	NS	12,890
Subtotal-top 20 ports	1,322,800	623,400	699,400	6.0	1,249,865
<b>Tonnage, total all U.S. water ports</b>	<b>2,284,100</b>	<b>1,100,700</b>	<b>1,183,400</b>	<b>NA</b>	<b>NA</b>
<b>Percent of tonnage of all U.S. water ports</b>	<b>57.9</b>	<b>56.6</b>	<b>59.1</b>	<b>6.0</b>	<b>NA</b>

KEY: NA = Not applicable. NS = Not significant.

NOTE: Ports are ranked by total tonnage.

**SOURCES**Tonnage: U.S. Army Corps of Engineers. *Waterborne Commerce of the United States, National Summaries, Part 5*. (New Orleans, LA: 1996).

Percent of containerized shipments: U.S. Army Corps of Engineers. Navigation Data Center. Special tabulation. (New Orleans, LA: 1998).



**table 12-2**

# Vehicle-Miles by Mode

(Millions of vehicle miles)

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
<b>Air</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>8,793</b>	<b>8,424</b>	<b>8,335</b>
Air carriers	N	N	N	78	222	190	3,963	4,629	4,811
<b>Road</b>	<b>N</b>	<b><sup>e</sup>197,055</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>2,144,400</b>	<b>2,422,700</b>	<b>2,482,200</b>
Personal vehicles	N	<sup>e</sup> 168,469	N	N	N	N	1,992,400	2,238,100	2,292,900
Passenger cars	N	<sup>e</sup> 134,440	N	N	N	N	1,408,300	1,438,300	1,467,700
Motorcycles	N	<sup>e</sup> 649	N	N	N	N	9,600	9,800	9,900
Light trucks	N	<sup>e</sup> 33,380	N	N	N	N	574,600	790,000	815,300
Bus	887	1,042	996	N	N	N	5,700	6,400	6,500
Charter	62	84	97	N	N	N	N	N	N
Intercity	105	96	81	N	N	N	N	N	N
Local motor	478	461	445	N	N	N	2,130	2,184	2,165
School	242	401	373	N	N	N	N	N	N
Commercial freight vehicles	N	<sup>e</sup> 27,545	N	N	N	N	146,200	178,200	182,800
Single-unit trucks	N	N	N	N	N	N	51,900	62,700	64,000
Tractor	N	N	N	N	N	N	94,300	115,500	118,800
<b>Rail, train-miles</b>	<b>78</b>	<b>87</b>	<b>84</b>	<b>30</b>	<b>24</b>	<b>25</b>	<b>413</b>	<b>490</b>	<b>499</b>
Freight	63	74	70	17	15	16	380	458	469
Intercity passenger	15	13	13	13	9	9	33	32	30
<b>Transit</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>U</b>	<b>U</b>	<b>U</b>	<b>3,242</b>	<b>3,550</b>	<b><sup>P</sup>3,663</b>
Transit rail	N	N	N	U	U	U	774	810	822

**KEY:** e = Data are estimated. N = Data are nonexistent. p = Data are preliminary. U = Data are unavailable.

## NOTES

### Canada

Road, all data except bus: The number of total road vehicle kilometers for 1995 is an estimate. See Appendix B for explanation.

Bus: All bus data are from a sample of Canadian companies engaged in scheduled intercity bus, urban transit, school bus and charter and other types of bus service from Statistics Canada's annual *Survey of the Passenger Bus and Urban Transit Industry*.

Transit: Although vehicle kilometers for transit rail are nonexistent, vehicle kilometers for local motor bus are included under road, buses.

### Mexico

Air: Includes only kilometers traveled by domestic airlines under scheduled operations serving domestic and international flights.

Road: Although no data are collected for vehicle travel on all Mexican roads, the Mexican Institute of Transport (IMT) estimates that the total vehicle-kilometers for all types of passenger cars, trucks and buses using the main interurban road corridors (of which there are 10) is approximately 36 billion vehicle kilometers per year. Main interurban road corridors comprise 25,190 kilometers or approximately 5 percent of the Mexican national highway network. For additional information on main interurban road corridors and Mexico's national road network, see the Secretaría de Comunicaciones y Transportes (SCT) report, *Modernization of the Main Highway System* (Mexico City, D.F.: 1998.)

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## Vehicle-Miles by Mode—Continued

**Mexico**

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## TRANSPORTATION in NORTH AMERICA

### LEGEND

- MAJOR HIGHWAYS
- MAJOR RAIL LINES
- MAJOR CITY
- MAJOR AIRPORT
- MAJOR WATER PORTS AND FACILITIES
- BORDER CROSSING



Proportion

Data provided by the Secretariat for Communication and Transport - Mexico, Transport Canada, the U.S. Federal Highway Administration, the U.S. Federal Railroad Administration, and the U.S. Federal Aviation Administration. The Canadian highway network was provided through American Digital Cartography, Inc. (ADC). ADC WorldMap data is used with permission from ADC. ADC WorldMap is a registered trademark of American Digital Cartography, Inc. Major cities include the top twenty-five metropolitan areas in each country based on population. Major airports are those with annual operations of at least 100,000. Major water ports include the top twenty ports, by tonnage, in each country. The Canadian Territory of Nunavut was created in April 1999.

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